

# 9 Mobility management

Editor’s note: Intended to capture tests of  
5G Core Network behaviour defined in TS 24.301, TS 24.501 et.al.

Multi-RAT Dual Connectivity behaviour defined in TS 37.340.  
Possible configurations may be handled in the following sub-structure:  
a) E-UTRA–NR DC via EPC with E-UTRA as master (also referred to EN-DC, option 3, 3a, 3x)  
b) E-UTRA–NR DC via 5GC  
- with E-UTRA as master (also referred to NGEN-DC, option 7, 7a, 7x)  
- with NR as master (also referred to NE-DC, option 4, 4A)

## 9.1 5GS Mobility Management

### 9.1.1 Primary authentication and key agreement

#### 9.1.1.1 EAP based primary authentication and key agreement / EAP-AKA' related procedures

##### 9.1.1.1.1 Test Purpose (TP)

(1)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }  
  
ensure that {  
  
    when { the SS sends an EAP-Request/AKA'-Identity message within AUTHENTICATION REQUEST }  
  
    then { the UE sends an EAP-Response/AKA'-Identity message within AUTHENTICATION RESPONSE }  
  
}
```

(2)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }  
  
ensure that {  
  
    when { the SS sends the EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST with the  
sequence number in AUTN is not correct }  
  
    then { the UE sends an EAP-response/AKA'-synchronization-failure message within AUTHENTICATION  
RESPONSE }  
  
}
```

(3)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }  
  
ensure that {
```

```
when { the SS sends an EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST }  
  
then { the UE sends an EAP-response/AKA'-challenge message within AUTHENTICATION RESPONSE }  
  
}
```

(4)

with { the UE in 5GMM-REGISTERED-INITIATED state and SS initiates an EAP based primary authentication and key agreement procedure }

```
ensure that {  
  
  when { the SS sends an EAP-success message within AUTHENTICATION RESULT }  
  
  then { the UE considers the procedure complete and authentication procedure succeed }  
  
}
```

9.1.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clauses 5.4.1.2.2.3, 5.4.1.2.2.4, 5.4.1.2.2.6B, 5.4.1.2.2.8.

[TS 24.501, clause 5.4.1.2.2.6B (TP1)]

Upon receipt of the AUTHENTICATION REQUEST message with EAP-Request/Identity message the UE shall send an AUTHENTICATION RESPONSE message with EAP-Response/Identity to the network. In the EAP-Response/Identity message, the UE shall provide the requested identity according to 3GPP TS 33.501 [24] annex F.2, in the UE identity in the EAP-Response/Identity message as specified in IETF RFC 5448 [40].

Upon receipt of the AUTHENTICATION REQUEST message with EAP-Request/AKA'-Identity message the UE shall send an AUTHENTICATION RESPONSE message with EAP-Response/AKA'-Identity to the network. Based on the attribute received in the EAP-Request/AKA'-Identity, the UE shall provide the requested identity according to 3GPP TS 33.501 [24] annex F.2, in the EAP-Response/AKA'-Identity message, as specified in IETF RFC 5448 [40].

If the EAP-Request/AKA'-Identity carries the AT\_PERMANENT\_REQ, the UE shall respond with EAP-Response/AKA'-Client-Error with the error code "unable to process packet".

[TS 24.501, clause 5.4.1.2.2.4 (TP2)]

If a USIM is present, the SNN check fails or the UE does not accept AUTN during handling of the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40], the UE shall send an EAP-response/AKA'-authentication-reject message as specified in IETF RFC 5448 [40].

If a USIM is present, the SNN check is successful but the UE detects that the sequence number in AUTN is not correct during handling of the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40], the UE shall send an EAP-response/AKA'-synchronization-failure message as specified in IETF RFC 5448 [40].

If a USIM is present, the SNN check is successful, the sequence number in AUTN is correct and the UE detects another error during handling of the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40], the UE shall send an EAP-response/AKA'-client-error message as specified in IETF RFC 5448 [40].

If a USIM is not present, the UE shall send an EAP-response/AKA'-client-error message as specified in IETF RFC 5448 [40].

For any of the above, the UE shall start timer T3520 when the AUTHENTICATION RESPONSE message containing the EAP-response message is sent. Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon receiving an AUTHENTICATION REQUEST message with the EAP message IE containing an EAP-request/AKA'-challenge from the network, the UE shall stop timer T3520, if running, and then process the EAP-request/AKA'-challenge information as normal.

[TS 24.501, clause 5.4.1.2.2.3 (TP3)]

If a USIM is present and the SNN check is successful, the UE shall handle the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40]. The USIM shall derive CK and IK and compute the authentication response (RES) using the 5G authentication challenge data received from the ME, and pass RES to the ME. The ME shall derive CK' and IK' from CK and IK, and EMSK from CK' and IK'. Furthermore, the ME may generate  $K_{AUSF}$  from the EMSK, the  $K_{SEAF}$  from the  $K_{AUSF}$ , and the  $K_{AMF}$  from the ABBA received together with the EAP-request/AKA'-challenge message, and the  $K_{SEAF}$  as described in 3GPP TS 33.501 [24], and create a partial native 5G NAS security context identified by the ngKSI value received together with the EAP-request/AKA'-challenge message in clause 5.4.1.2.4.2 in the volatile memory of the ME. If the  $K_{AMF}$  and the partial native 5G NAS security context are created, the ME shall store the  $K_{AMF}$  in the created partial native 5G NAS security context, and shall send an EAP-response/AKA'-challenge message as specified in IETF RFC 5448 [40].

If the EAP-request/AKA'-challenge message contains AT\_RESULT\_IND attribute, the UE may include AT\_RESULT\_IND attribute in the EAP-response/AKA'-challenge message as specified in IETF RFC 5448 [40].

[TS 24.501, clause 5.4.1.2.2.8 (TP4)]

Upon receiving an EAP-success message, if the ME has not generated a partial native 5G NAS security context as described in subclause 5.4.1.2.2.3, the ME shall:

- a) generate the  $K_{AUSF}$  from the EMSK, the  $K_{SEAF}$  from the  $K_{AUSF}$ , and the  $K_{AMF}$  from the ABBA that was received with the EAP-success message, and the  $K_{SEAF}$  as described in 3GPP TS 33.501 [24];
- b) create a partial native 5G NAS security context identified by the ngKSI value in the volatile memory of the ME; and
- c) store the  $K_{AMF}$  in the created partial native 5G NAS security context.

The UE shall consider the procedure complete.

9.1.1.1.3

Test description

9.1.1.1.3.1

Pre-test conditions

System Simulator:

- NGC Cell A is configured according to table 6.3.2.2-1 in TS 38.508-1 [4].

UE:

- None

Preamble:

- The UE is in state Switched OFF Mode (state 0N-B) according to TS 38.508-1 [4].

9.1.1.1.3.2 Test procedure sequence

Table 9.1.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on.	-	-	-	-
2-4	The UE establishes RRC connection and initiates registration procedure by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
5	SS transmits an AUTHENTICATION REQUEST message with an EAP-Request/AKA'-Identity message.	<--	5GMM: AUTHENTICATION REQUEST		
6	Check: Does the UE respond with an AUTHENTICATION RESPONSE message, with an EAP-Response/AKA'-Identity message?	-->	5GMM: AUTHENTICATION RESPONSE	1	P
7	SS transmits an AUTHENTICATION REQUEST message with an EAP-Request/AKA'-challenge message which contains a not correct sequence number.	<--	5GMM: AUTHENTICATION REQUEST	-	-
8	Check: Does the UE respond with an AUTHENTICATION RESPONSE message, with an EAP-Response/AKA'-synchronization-failure?	-->	5GMM: AUTHENTICATION RESPONSE	2	P
9	SS transmits a correct AUTHENTICATION REQUEST message with an EAP-Request/AKA'-challenge message.	<--	5GMM: AUTHENTICATION REQUEST	-	-
10	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message, with an EAP-Response/AKA'-challenge message?	-->	5GMM: AUTHENTICATION RESPONSE	3	P
11	SS transmits an AUTHENTICATION RESULT message with an EAP-success message.	<--	5GMM: AUTHENTICATION RESULT	-	-
12-18	The registration procedure is performed by executing steps 8-14 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
19	Check: Does the UE transmits a REGISTRATION COMPLETE message?	-->	5GMM: REGISTRATION COMPLETE	4	P
20	Steps 19a1 of Table 4.5.2.2-2 in TS 38.508-1 [4] are performed	-	-	-	-

9.1.1.1.3.3 Specific message contents

Table 9.1.1.1.3.3-1: Message AUTHENTICATION REQUEST (step 5, Table 9.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-request/AKA'-Identity	See Table 9.1.1.1.3.3-7	EAP-AKA

Table 9.1.1.1.3.3-2: Message AUTHENTICATION RESPONSE (step 6, Table 9.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition

EAP message	EAP-response/AKA'-Identity	See Table 9.1.1.1.3.3-8	EAP-AKA
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Table 9.1.1.1.3.3-3: Message AUTHENTICATION REQUEST (step 7, Table 9.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-request/AKA'-challenge	The sequence number in AUTN is not correct	EAP-AKA

Table 9.1.1.1.3.3-4: Message AUTHENTICATION RESPONSE (step 8, Table 9.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-response/AKA'-synchronization-failure		EAP-AKA

Table 9.1.1.1.3.3-5: Message AUTHENTICATION RESPONSE (step 10, Table 9.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-Response/AKA'-Challenge	RES* equal to the XRES* calculated in the SS with the parameters provided/indicated in the AUTHENTICATION REQUEST	EAP-AKA

Table 9.1.1.1.3.3-6: Message AUTHENTICATION RESULT (step 11, Table 9.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-3			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-Success		EAP-AKA

Table 9.1.1.1.3.3-7: Message EAP-Request/AKA'-Identity (Table 9.1.1.1.3.3-1)

Derivation Path: IETF RFC 4187 [30] clause 9.1, RFC 3748 [32] clause 4			
Information Element	Value/Remark	Comment	Condition
Code	1	Request	
Length	Set to length of EAP packet		
Data			
AT_ANY_ID_REQ	AT_ANY_ID_REQ_Def	See Table 9.1.1.1.3.3-9	

Table 9.1.1.1.3.3-8: Message EAP-Response/AKA'-Identity (Table 9.1.1.1.3.3-2)

Derivation Path: IETF RFC 4187 [30] clause 9.2, RFC 3748 [32] clause 4			
Information Element	Value/Remark	Comment	Condition
Code	2	Response	
Length	Set to length of EAP packet		
Data			
AT_IDENTITY	AT_IDENTITY_Def	See Table 9.1.1.1.3.3-10	

Table 9.1.1.1.3.3-9: AT\_ANY\_ID\_REQ\_Def (Table 9.1.1.1.3.3-7)

Derivation Path: IETF RFC 4187 [30] clause 10.3			
Information Element	Value/remark	Comment	Condition
AT_ANY_ID_REQ	'0000 1101'B	13	
Length	'0000 0001'B	1	
Reserved	'0000 0000 0000 0000'B		

Table 9.1.1.1.3.3-10: AT\_IDENTITY\_Def (Table 9.1.1.1.3.3-8)

Derivation Path: IETF RFC 4187 [30] clause 10.5			
Information Element	Value/remark	Comment	Condition
AT_IDENTITY	'0000 1110'B	14	
Length	Set to the Length of AT_IDENTITY attribute in 4 bytes		
Actual Identity Length	Set to the actual length of 'identity' in bytes excluding any appended all zero bytes at end		
Identity	Value generated according to TS 24.501 [28] clause 9.11.3.4 and shall be a multiple of 4 bytes (appended with 1,2 or 3 bytes of all zero bits when necessary)	SUCI of the UE	

9.1.1.2 EAP based primary authentication and key agreement / Reject

9.1.1.2.1 Test Purpose (TP)

(1)

with {the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

when { the SS sends the EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST with incorrect SNN }

```
    then { the UE sends an EAP-response/AKA'-authentication-reject message within AUTHENTICATION RESPONSE }  
  
    }
```

(2)

```
with {the UE in 5GMM-REGISTERED-INITIATED state }  
  
ensure that {  
  
    when { the SS sends an EAP-Request/AKA'-notification message within AUTHENTICATION REQUEST }  
  
        then { the UE sends an EAP-Response/AKA'-notification message within AUTHENTICATION RESPONSE }  
  
    }
```

(3)

```
with {the UE in 5GMM-REGISTERED-INITIATED state and SS initiates an EAP based primary authentication and key agreement procedure}  
  
ensure that {  
  
    when { the SS sends an EAP-failure message within AUTHENTICATION REJECT }  
  
        then { the UE deletes the stored 5G-GUTI, TAI list, last visited registered TAI and ngKSI and enter state 5GMM-DEREGISTERED, the USIM is considered invalid until switching off the UE }  
  
    }
```

9.1.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clauses 5.4.1.2.2.4, 5.4.1.2.2.6, and 5.4.1.2.2.11.

[TS 24.501, clause 5.4.1.2.2.4]

If a USIM is present, the SNN check fails or the UE does not accept AUTN during handling of the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40], the UE shall send an EAP-response/AKA'-authentication-reject message as specified in IETF RFC 5448 [40].

If a USIM is present, the SNN check is successful but the UE detects that the sequence number in AUTN is not correct during handling of the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40], the UE shall send an EAP-response/AKA'-synchronization-failure message as specified in IETF RFC 5448 [40].

If a USIM is present, the SNN check is successful, the sequence number in AUTN is correct and the UE detects another error during handling of the EAP-request/AKA'-challenge message as specified in IETF RFC 5448 [40], the UE shall send an EAP-response/AKA'-client-error message as specified in IETF RFC 5448 [40].

If a USIM is not present, the UE shall send an EAP-response/AKA'-client-error message as specified in IETF RFC 5448 [40].

For any of the above, the UE shall start timer T3520 when the AUTHENTICATION RESPONSE message containing the EAP-response message is sent. Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon receiving an AUTHENTICATION REQUEST message with the EAP message IE

containing an EAP-request/AKA'-challenge from the network, the UE shall stop timer T3520, if running, and then process the EAP-request/AKA'-challenge information as normal.

[TS 24.501, clause 5.4.1.2.2.6]

Upon receiving an EAP-request/AKA'-notification message, the UE shall send an EAP-response/AKA'-notification message as specified in IETF RFC 5448 [40].

[TS 24.501, clause 5.4.1.2.2.11]

Upon receiving an EAP-failure message, the UE shall delete the partial native 5G NAS security context if any was created as described in subclause 5.4.1.2.2.3.

The UE shall consider the procedure complete.

If the EAP-failure message is received in an AUTHENTICATION REJECT message:

- the UE shall set the update status to 5U3 ROAMING NOT ALLOWED, delete the stored 5G-GUTI, TAI list, last visited registered TAI and ngKSI. The USIM shall be considered invalid until switching off the UE or the UICC containing the USIM is removed; and
- if the UE is operating in single-registration mode, the UE shall handle 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the authentication procedure is not accepted by the network. The USIM shall be considered as invalid also for non-EPS services until switching off or the UICC containing the USIM is removed.

If the AUTHENTICATION REJECT message is received by the UE, the UE shall abort any 5GMM signalling procedure, stop any of the timers T3510, T3517 or T3521 (if they were running) and enter state 5GMM-DEREGISTERED.

9.1.1.2.3

Test description

9.1.1.2.3.1

Pre-test conditions

System Simulator:

- NGC Cell A "Serving cell" TS 38.508-1 [4] Table 6.2.2.1-3

UE:

- None

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.1.2.3.2

Test procedure sequence

Table 9.1.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		



1	The UE is switched on.	-	-	-	-
2-4	The UE executes steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
5	The SS transmits "EAP-request/AKA'-challenge" message in AUTHENTICATION REQUEST with incorrect SNN.		5GMM: AUTHENTICATION REQUEST	-	-
6	Check: Does the UE transmit an "EAP-response/AKA'-authentication-reject" message in AUTHENTICATION RESPONSE?		5GMM: AUTHENTICATION RESPONSE	1	P
6A	The SS transmits "EAP-failure" message within AUTHENTICATION RESULT message.	<--	5GMM: AUTHENTICATION RESULT	-	-
7	The SS transmits "EAP-request/AKA'-challenge" message in AUTHENTICATION REQUEST.		5GMM: AUTHENTICATION REQUEST	-	-
8	The UE transmit an "EAP-response/AKA'-challenge" message in AUTHENTICATION RESPONSE.		5GMM: AUTHENTICATION RESPONSE	-	-
9	The SS transmits "EAP- request /AKA'-notification"message in AUTHENTICATION REQUEST.		5GMM: AUTHENTICATION REQUEST	-	-
10	Check: Does the UE transmit an "EAP-response/AKA'-notification" message in AUTHENTICATION RESPONSE?		5GMM: AUTHENTICATION RESPONSE	2	P
11	The SS transmits an "EAP-failure" message within AUTHENTICATION REJECT	<--	5GMM: AUTHENTICATION REJECT	-	-
12	SS releases the RRC connection	-	-	-	-
13	Check: Does the UE transmit an RRCSetupRequest message for initial registration procedure within the next 30 seconds?	-->	NR RRC: <i>RRCSetupRequest</i>	3	F
14	The UE is switched off by executing generic procedure in Table 4.9.6.4-1 in TS 38.508-1 [4].	-	-	-	-
15	The UE is switched on.	-	-	-	-
16	Check: Does the UE transmit a REGISTRATION REQUEST message?	-->	5GMM: REGISTRATION REQUEST	3	P
17	The UE executes steps 5-20a1 of Table 4.5.2.2-2 in TS38.508-1 [4] complete registration procedure.	-	-	-	-

9.1.1.2.3.3 Specific message contents

Table 9.1.1.2.3.3-1: AUTHENTICATION REQUEST (step 5, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition

Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
EAP message	“EAP-request/AKA'-challenge”	SNN in EAP message is incorrect or does not match with the PLMN identity saved in the UE.	
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-2: AUTHENTICATION RESPONSE (step 6, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
EAP message	“EAP-response/AKA'-authentication-reject “		
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-2A: AUTHENTICATION RESULT (step 6A, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-3			
Information Element	Value/Remark	Comment	Condition
Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
ngKSI	The same value as the last AUTHENTICATION REQUEST message		
Spare half octet	'0000'B		
EAP message	EAP-failure	EAP-failure	
ABBA	'0000 0000 0000 0000'B		
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-3: AUTHENTICATION RESPONSE (step 8, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition

Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
EAP message	"EAP-request/AKA'-challenge"		
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-4: AUTHENTICATION REQUEST (step 9, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
EAP message	"EAP-request /AKA'-notification"	See Table 9.1.1.2.3.3-8	
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-5: AUTHENTICATION RESPONSE (step 10, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
EAP message	"EAP-response/AKA'-notification"	See Table 9.1.1.2.3.3-9	
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-6: AUTHENTICATION REJECT (step 11, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-5			
Information Element	Value/Remark	Comment	Condition
Extended protocol discriminator	5GMM		
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
EAP message	EAP-failure	EAP-failure	
NOTE: This message is sent within SECURITY PROTECTED 5GS NAS MESSAGE message with Integrity protected and ciphered.			

Table 9.1.1.2.3.3-7: REGISTRATION REQUEST (step16, Table 9.1.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition

5GS registration type	'0000 0010'B	Initial registration	
ngKSI			
NAS key set identifier	'111'B	no key is available	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
Last visited registered TAI	Not present		
5GS mobile identity	SUCI of the UE		

Table 9.1.1.2.3.3-8: EAP-Request/AKA'-Notification (Table 9.1.1.2.3.3-4)

Derivation Path: IETF RFC 4187 [30] clause 9.10, RFC 3748 [32] clause 4			
Information Element	Value/Remark	Comment	Condition
Code	1	Request	
Length	Set to length of EAP packet		
Data			
AT_NOTIFICATION	AT_NOTIFICATION_Def	See Table 9.1.1.2.3.3-10	

Table 9.1.1.2.3.3-9: EAP-Response/AKA'-Notification (Table 9.1.1.2.3.2-5)

Derivation Path: IETF RFC 4187 [30] clause 9.11, RFC 3748 [32] clause 4			
Information Element	Value/Remark	Comment	Condition
Code	2	Response	
Length	Set to length of EAP packet		
Data	Not present		

Table 9.1.1.2.3.3-10: AT\_NOTIFICATION\_Def (Table 9.1.1.2.3.3-8)

Derivation Path: IETF RFC 4187 [30] clause 10.19			
Information Element	Value/remark	Comment	Condition
AT_NOTIFICATION	'0000 1100'B	12	
Length	'0000 0001'B	1	
Notification Code	'0100 0000 0000 0000'B	Set to “General failure”	

9.1.1.3 EAP based primary authentication and key agreement / EAP message transport / Abnormal

9.1.1.3.1 Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

when { the SS sends the EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST with ngKSI is already in use }

```
    then { the UE sends an AUTHENTICATION FAILURE message with 5GMM cause #71 "ngKSI already in use" }  
  
  }
```

(2)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }  
  
ensure that {  
  
  when { the third time SS sends the EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST with ngKSI is already in use }  
  
    then { the UE locally releases the RRC connection and treats the active cell as barred }  
  
}
```

(3)

```
with { the UE in 5GMM-REGISTERED-INITIATED state, the SS sends the EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST with ngKSI is already in use and the UE sends an AUTHENTICATION FAILURE message }  
  
ensure that {  
  
  when { T3520 times out }  
  
    then { the UE locally releases the RRC connection and treats the active cell as barred }  
  
}
```

(4)

Void

(5)

```
with { the UE in 5GMM-REGISTERED state and initiates a mobility registration update procedure }  
  
ensure that {  
  
  when { the SS sends the EAP-request/AKA'-challenge message within AUTHENTICATION REQUEST and the UE fails on transmission of AUTHENTICATION RESPONSE message with the indication from lower layers }  
  
    then { the UE re-initiate the mobility registration update procedure }  
  
}
```

9.1.1.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clauses 5.4.1.2.4.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.1.2.4.5 (TP1, TP2, TP3, TP4, TP5)]

The following abnormal cases can be identified:

- a) Authentication failure (5GMM cause #71 "ngKSI already in use").

The UE shall send an AUTHENTICATION FAILURE message, with 5GMM cause #71 "ngKSI already in use", to the network and start the timer T3520 (see example in figure 5.4.1.3.7.1). Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon the first receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #71 "ngKSI already in use", the network performs necessary actions to select a new ngKSI and send the same EAP-request message to the UE.

NOTE 1: Upon receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #71 "ngKSI already in use", the network can also re-initiate the EAP based primary authentication and key agreement procedure (see subclause 5.4.1.2.2.2).

Upon receiving a new AUTHENTICATION REQUEST message with the EAP message IE containing an EAP-request message from the network, the UE shall stop timer T3520, if running, process the EAP-request message as normal.

If the network is validated successfully (an AUTHENTICATION REQUEST message that contains a valid ngKSI and EAP-request message is received), the UE shall send the AUTHENTICATION RESPONSE message to the network and shall start any retransmission timers (e.g. T3510, T3517 or T3521) if they were running and stopped when the UE received the first failed AUTHENTICATION REQUEST message.

- b) Transmission failure of AUTHENTICATION RESPONSE message or AUTHENTICATION FAILURE message indication from lower layers (if the EAP based primary authentication and key agreement procedure is triggered by a registration procedure for mobility and periodic registration update).

The UE shall stop the timer T3520, if running, and re-initiate the registration procedure for mobility and periodic registration update.

- c) Transmission failure of AUTHENTICATION RESPONSE message or AUTHENTICATION FAILURE message indication with TAI change from lower layers (if the EAP based primary authentication and key agreement procedure is triggered by a service request procedure).

The UE shall stop the timer T3520, if running.

If the current TAI is not in the TAI list, the EAP based primary authentication and key agreement procedure shall be aborted and a registration procedure for mobility and periodic registration update shall be initiated.

If the current TAI is still part of the TAI list, it is up to the UE implementation how to re-run the ongoing procedure that triggered the EAP based primary authentication and key agreement procedure.

...

- e) Network failing the authentication check.

If the UE deems that the network has failed the authentication check, then it shall request RRC to locally release the RRC connection and treat the active cell as barred (see 3GPP TS 38.304 [28]). The UE shall start any retransmission timers (e.g. T3510, T3517 or T3521), if they were running and stopped when the UE received the first AUTHENTICATION REQUEST message containing an ngKSI that was already in use.

For item e, whether or not the UE is registered for emergency services:

The UE shall stop timer T3520, if the timer is running and the UE enters 5GMM-IDLE mode, e.g. upon detection of a lower layer failure, release of the N1 NAS signalling connection, or as the result of an inter-system change in 5GMM-CONNECTED mode from N1 mode to S1 mode.

The UE shall deem that the network has failed the authentication check or assume that the authentication is not genuine and proceed as described in item e above if any of the following occurs:

- the timer T3520 expires;
- the UE detects any combination of the EAP-based authentication failures: transmission of AUTHENTICATION FAILURE message with 5GMM cause #71 "ngKSI already in use", transmission of AUTHENTICATION RESPONSE message with an EAP-response message after detecting an error as described in subclause 5.4.1.2.2.4 or with an EAP-response message after not accepting of the server certificate as described in subclause 5.4.1.2.3.1, during three consecutive authentication challenges. The EAP-request/AKA'-challenge challenges shall be considered as consecutive only, if the EAP-request/AKA'-challenge challenges causing the second and third EAP-based authentication failure are received by the UE, while the timer T3520 started after the previous EAP-based authentication failure is running. Not accepting of the server certificate shall be considered as consecutive only, if the EAP-request messages causing the second and third not accepting of the server certificate are received by the UE, while the timer T3520 started after the previous EAP request message causing the previous not accepting of the server certificate is running.

NOTE 2: Reception of an EAP-failure message is not considered when determining the three consecutive authentication challenges or three consecutive not accepting of the server certificate.

...

9.1.1.3.3

Test description

9.1.1.3.3.1

Pre-test conditions

System Simulator:

- NGC Cell A, NGC Cell B, NGC Cell C and NGC Cell D are configured according to table 6.3.2.2-1 in TS 38.508-1 [4].
- System information combination NR-2 as defined in TS 38.508-1 [4] clause 4.4.3.1.2 is used.

UE:

- None

Preamble:

- The UE is in state Switched OFF Mode (state 0N-B) according to TS 38.508-1 [4].

9.1.1.3.3.2

Test procedure sequence

Table 9.1.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell B, NGC Cell C and NGC Cell D as a "Non-suitable 'Off' cell".	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
2	The UE is switched on.	-	-	-	-
3-5	The UE establishes RRC connection by	-->	5GMM: REGISTRATION	-	-

	executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4] and transmits a REGISTRATION REQUEST message.		REQUEST		
6	SS transmits the EAP-request/AKA'-challenge message within an AUTHENTICATION REQUEST message, with ngKSI is already in use in the UE to initiate an EAP-AKA' procedure.	<--	5GMM: AUTHENTICATION REQUEST	-	-
7	Check: Does the UE respond with an AUTHENTICATION FAILURE message, with 5GMM cause "ngKSI already in use"?	-->	5GMM: AUTHENTICATION FAILURE	1	P
8	SS transmits the EAP-request/AKA'-challenge message within an AUTHENTICATION REQUEST message, with ngKSI is already in use in the UE to initiate an EAP-AKA' procedure.	<--	5GMM: AUTHENTICATION REQUEST	-	-
9	Check: Does the UE respond with an AUTHENTICATION FAILURE message, with 5GMM cause "ngKSI already in use"?	-->	5GMM: AUTHENTICATION FAILURE	1	P
10	The SS configures: - NGC Cell B as the "Serving cell". - NGC Cell A as a "Suitable neighbour intra-frequency cell".	-	-	-	-
11	SS transmits the EAP-request/AKA'-challenge message within an AUTHENTICATION REQUEST message, with ngKSI is already in use in the UE to initiate an EAP-AKA' procedure.	<--	5GMM: AUTHENTICATION REQUEST	-	-
11a	EXCEPTION: The UE may send an AUTHENTICATION FAILURE before locally releasing the RRC Connection	-->	5GMM: AUTHENTICATION FAILURE	-	-
-	The following messages are to be observed on NGC Cell B unless explicitly stated otherwise.	-	-	-	-
12-14	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
15	Check: Does the UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as Initial registration?	-->	5GMM: REGISTRATION REQUEST	2	P
16	SS transmits the EAP-request/AKA'-challenge message within an AUTHENTICATION REQUEST message, with ngKSI is already in use in the UE to initiate an EAP-AKA' procedure.	<--	5GMM: AUTHENTICATION REQUEST	-	-
17	The UE responds with an AUTHENTICATION FAILURE message, with 5GMM cause "ngKSI already in use".	-->	5GMM: AUTHENTICATION FAILURE	-	-
17A	The SS starts timer of t_Waits=T3520.	-	-	-	-
18	The SS configures: - NGC Cell C as the "Serving cell". - NGC Cell B as a "Suitable neighbour intra-frequency cell". - NGC Cell A as the "Non-suitable 'Off' cell".	-	-	-	-
19	SS responds nothing and waits for the expiration of t_Waits.	-	-	-	-
-	The following messages are to be observed on NGC Cell C unless explicitly stated otherwise.	-	-	-	-
20-22	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS	-	-	-	-



	38.508-1 [4].				
23	Check: Does the UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as Initial registration?	-->	5GMM: REGISTRATION REQUEST	3	P
24-39a1	The registration procedure is successfully completed by executing steps 5 to 20a1 of the generic procedure in TS 38.508-1 [4] Table 4.5.2.2-2.	-	-	-	-
-	The UE is in end state Registered, Idle Mode (1N-A) on NGC Cell C according to TS 38.508-1 [4].	-	-	-	-
40-44	Void	-	-	-	-
45	The SS configures: - NGC Cell D as the "Serving cell", and the tracking area of NGC Cell D is not in the list of tracking areas that the UE previously registered. - NGC Cell C as the "Suitable neighbour intra-frequency cell". - NGC Cell B as the "Non-suitable 'Off' cell".	-	-	-	-
46-47	Void	-	-	-	-
-	The following messages are to be observed on Cell D unless explicitly stated otherwise.	-	-	-	-
48-50	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
51	The UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as Mobility registration updating.	-->	5GMM: REGISTRATION REQUEST	-	-
52	The SS cuts off the UL grant and RA Response. (Note 1)	-	-	-	-
53	SS transmits the EAP-request/AKA'-challenge message within a correct AUTHENTICATION REQUEST message to initiate an EAP-AKA' procedure.	<--	5GMM: AUTHENTICATION REQUEST	-	-
54	SS starts a timer t_Delay = 10s. (Note 2)	-	-	-	-
55	SS locally releases the RRC connection and waits for the expiration of t_Delay.	-	-	-	-
56	The SS turn on the UL grant and RA Response.	-	-	-	-
57-59	The UE establishes RRC connection by executing steps 1-3 of Table 4.9.5.2.2-1 in TS 38.508-1 [4].	-	-	-	-
60	Check: Does the UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as mobility registration updating?	-->	5GMM: REGISTRATION REQUEST	5	P
61-63a1	The registration procedure is successfully completed by executing steps 4 to 6a1 of the generic procedure in TS 38.508-1 [4] Table 4.9.5.2.2-1.	-	-	-	-
Note 1: For transmission of the AUTHENTICATION RESPONSE message, the UE needs to initiate RACH to get UL grant. Since not RA Response, registration failure due to lower layer failure will occur, then timer T3511 will be started.					
Note 2: Timer t_Delay is derived from timer T3511. During timer t_Delay, UE fails on transmission of the					

AUTHENTICATION RESPONSE message with the indication from lower layers.

9.1.1.3.3.3Specific message contents

Table 9.1.1.3.3.3-1: AUTHENTICATION REQUEST (step 6, 8, 11 and 16, Table 9.1.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
ngKSI	ngKSI	SS shall use the ngKSI is already in use in the UE	

Table 9.1.1.3.3.3-2: AUTHENTICATION FAILURE (step 7, 9, 11a1 and 17, Table 9.1.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-4			
Information Element	Value/Remark	Comment	Condition
5GMM cause	'0100 0111'B	ngKSI already in use	

Table 9.1.1.3.3.3-3: REGISTRATION REQUEST (step 15 and step 23, Table 9.1.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'001'B	Initial registration	

Table 9.1.1.3.3.3-4: REGISTRATION REQUEST (step 51 and step 60, Table 9.1.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'010'B	Mobility registration updating	

Table 9.1.1.3.3.3-5: AUTHENTICATION REQUEST (step 53, Table 9.1.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
ngKSI	ngKSI	Different from the ngKSI assigned in step 24.	

9.1.1.45G AKA based primary authentication and key agreement / 5G-AKA related procedures

9.1.1.4.1Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

```
    when { the SS initiates a 5G AKA based primary authentication and key agreement procedure by
sending AUTHENTICATION REQUEST with invalid MAC code }

    then { the UE sends an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #20
"MAC failure" }

}
```

(2)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS initiates a 5G AKA based primary authentication and key agreement procedure by
sending AUTHENTICATION REQUEST with the "separation bit" in the AMF field of AUTN supplied by the
core network is set to 0 }

    then { the UE sends an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #26
"non-5G authentication unacceptable" }

}
```

(3)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS initiates a 5G AKA based primary authentication and key agreement procedure by
sending AUTHENTICATION REQUEST with the sequence number SQN to be out of range }

    then { the UE sends an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #21
"synch failure" and a re-synchronization token AUTS provided by the USIM }

}
```

(4)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS initiates a 5G AKA based primary authentication and key agreement procedure by
sending AUTHENTICATION REQUEST }

    then { the UE process the 5G authentication challenge data and respond with an AUTHENTICATION
RESPONSE message }

}
```

(5)

```
with { the UE in 5GMM-REGISTERED-INITIATED state and sends out an AUTHENTICATION RESPONSE message }

ensure that {

    when { the SS proceeds with the registration procedure }
```

```
    then { the UE consider the authentication procedure complete and succeed }  
  }
```

**9.1.1.4.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clauses 5.4.1.3.3, 5.4.1.3.6, 5.4.1.3.7. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.1.3.3]

The UE shall respond to an AUTHENTICATION REQUEST message. With the exception of the cases described in subclause 5.4.1.3.5, the UE shall process the 5G authentication challenge data and respond with an AUTHENTICATION RESPONSE message to the network.

Upon a successful 5G authentication challenge, the new  $K_{AMF}$  calculated from the 5G authentication challenge data shall be stored in a new 5G NAS security context in the volatile memory of the ME.

[TS 24.501, clause 5.4.1.3.6]

In the 5G authentication challenge, the UE shall check the 5G authentication challenge data (RAND, AUTN and ngKSI) received in the AUTHENTICATION REQUEST message to verify authenticity of the 5G core network.

The ME shall check that ngKSI received in the AUTHENTICATION REQUEST message is not already in use. The ME shall forward the RAND and AUTN to the USIM to check.

The UE may reject the core network due to an incorrect AUTN or ngKSI parameter. If the UE has to reject the 5G authentication challenge, the UE shall return AUTHENTICATION FAILURE message to the network with a cause value indicating the reason for the failure (see 3GPP TS 33.501 [24]).

Incorrect 5G authentication challenge data contains four possible causes for authentication failure:

a) MAC code failure:

If the UE finds the MAC code (supplied by the core network in the AUTN parameter) to be invalid, the UE shall send an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #20 "MAC failure". The UE shall then follow the procedure described in subclause 5.4.1.3.7, item c.

b) Non-5G authentication unacceptable:

If the UE finds that the "separation bit" in the AMF field of AUTN supplied by the core network is set to 0, the UE shall send an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #26 "non-5G authentication unacceptable" (see subclause 6.1.3 in 3GPP TS 33.501 [24]). The UE shall then follow the procedure described in subclause 5.4.1.3.7, item d.

...

d) SQN failure:

If the UE finds the sequence number SQN (supplied by the core network in the AUTN parameter) to be out of range, the UE shall send an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #21 "synch failure" and a re-synchronization token AUTS provided by the USIM (see 3GPP TS 33.102 [23]). The UE shall then follow the procedure described in subclause 5.4.1.3.7, item f.

[TS 24.501, clause 5.4.1.3.7]

c) Authentication failure (5GMM cause #20 "MAC failure").

The UE shall send an AUTHENTICATION FAILURE message, with 5GMM cause #20 "MAC failure" according to subclause 5.4.1.3.6, to the network and start timer T3520 (see example in figure 5.4.1.3.7.1). Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon the first receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #20 "MAC failure", the network may initiate the identification procedure described in subclause 5.4.3. This is to allow the network to obtain the SUCI from the UE. The network may then check that the 5G-GUTI originally used in the 5G authentication challenge corresponded to the correct SUPI. Upon receipt of the IDENTITY REQUEST message from the network, the UE shall proceed as specified in subclause 5.4.3.3.

NOTE 1: Upon receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #20 "MAC failure", the network may also terminate the 5G AKA based primary authentication and key agreement procedure (see subclause 5.4.1.3.5).

If the mapping of 5G-GUTI to SUPI in the network was incorrect, the network should respond by sending a new AUTHENTICATION REQUEST message to the UE. Upon receiving the new AUTHENTICATION REQUEST message from the network, the UE shall stop the timer T3520, if running, and then process the 5G challenge information as normal. If the mapping of 5G-GUTI to SUPI in the network was correct, the network should terminate the 5G AKA based primary authentication and key agreement procedure by sending an AUTHENTICATION REJECT message (see subclause 5.4.1.3.5).

If the network is validated successfully (an AUTHENTICATION REQUEST message that contains a valid SQN and MAC is received), the UE shall send the AUTHENTICATION RESPONSE message to the network and shall start any retransmission timers (e.g. T3510, T3517 or T3521) if they were running and stopped when the UE received the first failed AUTHENTICATION REQUEST message.

If the UE receives the second AUTHENTICATION REQUEST message, and the MAC value cannot be resolved, the UE shall follow the procedure specified in this subclause, item c, starting again from the beginning, or if the message contains a UMTS authentication challenge, the UE shall follow the procedure specified in item d. If the SQN is invalid, the UE shall proceed as specified in item f.

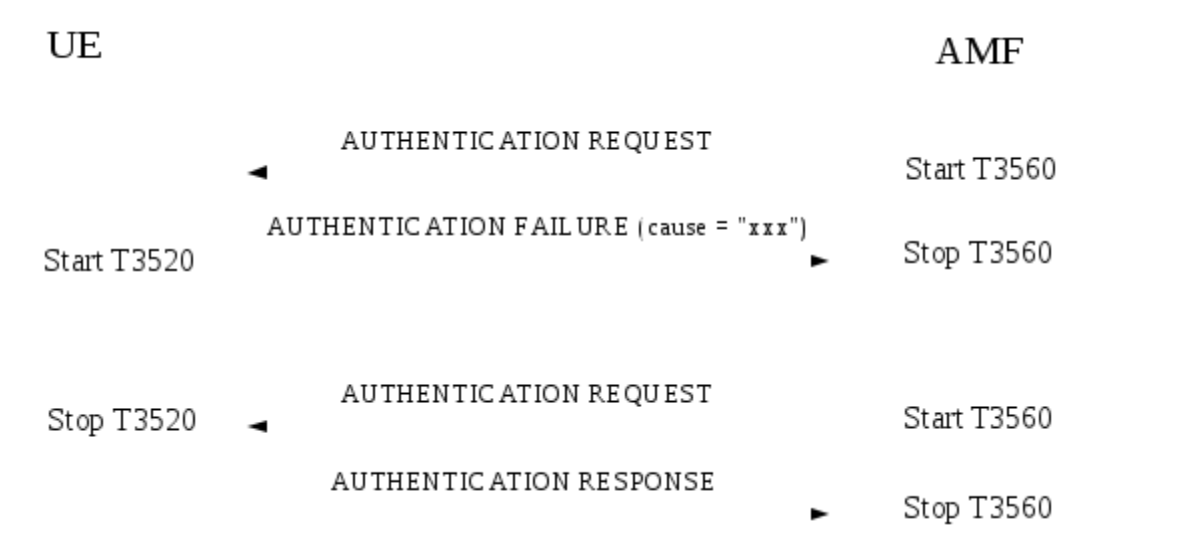


Figure 5.4.1.3.7.1: Authentication failure during 5G AKA based primary authentication and key agreement procedure

d) Authentication failure (5GMM cause #26 "non-5G authentication unacceptable").

The UE shall send an AUTHENTICATION FAILURE message, with 5GMM cause #26 "non-5G authentication unacceptable", to the network and start the timer T3520 (see example in figure 5.4.1.3.7.1). Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon the first receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #26 "non-5G authentication unacceptable", the network may initiate the identification procedure described in subclause 5.4.3. This is to allow the network to obtain the SUCI from the UE. The network may then check that the 5G-GUTI originally used in the 5G authentication challenge corresponded to the correct SUPI. Upon receipt of the IDENTITY REQUEST message from the network, the UE shall proceed as specified in subclause 5.4.3.3.

NOTE 2: Upon receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #26 "non-5G authentication unacceptable", the network may also terminate the 5G AKA based primary authentication and key agreement procedure (see subclause 5.4.1.3.5).

If the mapping of 5G-GUTI to SUPI in the network was incorrect, the network should respond by sending a new AUTHENTICATION REQUEST message to the UE. Upon receiving the new AUTHENTICATION REQUEST message from the network, the UE shall stop the timer T3520, if running, and then process the 5G challenge information as normal. If the mapping of 5G-GUTI to SUPI in the network was correct, the network should terminate the 5G AKA based primary authentication and key agreement authentication procedure by sending an AUTHENTICATION REJECT message (see subclause 5.4.1.3.5).

...

f) Authentication failure (5GMM cause #21 "synch failure").

The UE shall send an AUTHENTICATION FAILURE message, with 5GMM cause #21 "synch failure", to the network and start the timer T3520 (see example in figure 5.4.1.3.7.1). Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon the first receipt of an AUTHENTICATION FAILURE message from the UE with the 5GMM cause #21 "synch failure", the network shall use the returned AUTS parameter from the authentication failure parameter IE in the AUTHENTICATION FAILURE message, to re-synchronise. The re-synchronisation procedure requires the AMF to delete all unused authentication vectors for that SUPI and obtain new vectors from the UDM/AUSF. When re-synchronisation is complete, the network shall initiate the 5G AKA based primary authentication and key agreement procedure. Upon receipt of the AUTHENTICATION REQUEST message, the UE shall stop the timer T3520, if running.

NOTE 4: Upon receipt of two consecutive AUTHENTICATION FAILURE messages from the UE with 5GMM cause #21 "synch failure", the network may terminate the 5G AKA based primary authentication and key agreement procedure by sending an AUTHENTICATION REJECT message.

If the network is validated successfully (a new AUTHENTICATION REQUEST message is received which contains a valid SQN and MAC) while T3520 is running, the UE shall send the AUTHENTICATION RESPONSE message to the network and shall start any retransmission timers (e.g. T3510, T3517 or T3521), if they were running and stopped when the UE received the first failed AUTHENTICATION REQUEST message.

Upon receipt of an AUTHENTICATION REJECT message, the UE shall perform the actions as specified in subclause 5.4.1.3.5.

**9.1.1.4.3            Test description**

**9.1.1.4.3.1        Pre-test conditions**

**System Simulator:**

- NR cell A.

UE:

- None.

Preamble:

- the UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.1.4.3.2

Test procedure sequence

Table 9.1.1.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Switch the UE on	-	-	-	-
2-4	The UE establishes RRC connection and initiates registration procedure by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
5	The SS transmits an AUTHENTICATION REQUEST message which contains an invalid MAC code.	<--	AUTHENTICATION REQUEST	-	-
6	Check: Does the UE respond with an AUTHENTICATION FAILURE message with 5GMM cause "MAC failure"?	-->	AUTHENTICATION FAILURE	1	P
7	SS transmits a correct AUTHENTICATION REQUEST message with RAND different to the one send in Step 5	<--	AUTHENTICATION REQUEST	-	-
8	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message with RES* that is equal to the XRES* calculated in the SS?	-->	AUTHENTICATION RESPONSE	4	P
9	SS transmits a NAS SECURITY MODE COMMAND message including the ngKSI of the new 5G NAS security context (as provided in step 7), to proceed with the registration procedure.	<--	SECURITY MODE COMMAND	-	-
10	Check: Does the UE respond with NAS SECURITY MODE COMPLETE message integrity protected and ciphered with the new 5G NAS security context identified by the ngKSI received in the SECURITY MODE COMMAND message in step 9.	-->	SECURITY MODE COMPLETE	5	P
11-20a1	Steps 10-19a1 of the generic procedure (TS 38.508-1 Table 4.5.2.2-2 [4]) are executed to successfully complete the registration procedure.	-	-	-	-
21	Switch off UE in RRC_CONNECTED as described in TS 38.508-1 [4] subclause 4.9.6.3	-	-	-	-
22-25	Steps 1-4 above are repeated	-	-	-	-
26	SS transmits an AUTHENTICATION REQUEST message with "separation bit" in the AMF field is 0.	<--	AUTHENTICATION REQUEST	-	-
27	Check: Does the UE respond with an AUTHENTICATION FAILURE message, with 5GMM cause " Non-5G authentication unacceptable "?	-->	AUTHENTICATION FAILURE	2	P
28	SS transmits a correct AUTHENTICATION REQUEST message with RAND different to the one send in Step 26	<--	AUTHENTICATION REQUEST	-	-
29	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message with RES* that is equal to the XRES* calculated in the SS?	-->	AUTHENTICATION RESPONSE	4	P
30-41a1	Steps 8-19a1 of the generic procedure (TS 38.508-1 Table 4.5.2.2-2 [4]) are executed to successfully complete the registration procedure.	-	-	-	-
42	Switch off UE in RRC_CONNECTED as described in TS 38.508-1 [4] subclause 4.9.6.3	-	-	-	-
43-46	Steps 1-4 above are repeated	-	-	-	-
47	SS transmits AUTHENTICATION REQUEST message with the AMF field in the IE "Authentication parameter AUTN" set to	<--	AUTHENTICATION REQUEST	-	-



	"AMF <sub>RESYNCH</sub> " value to trigger SQN re-synchronisation procedure in test USIM				
48	Check: Does the UE respond with an AUTHENTICATION FAILURE message, with 5GMM cause "Synch failure" and Authentication failure parameter?	-->	AUTHENTICATION FAILURE	3	P
49	SS transmits a correct AUTHENTICATION REQUEST message with RAND different to the one send in Step 47.	<--	AUTHENTICATION REQUEST	-	-
50	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message with RES* that is equal to the XRES* calculated in the SS?	-->	AUTHENTICATION RESPONSE	4	P
51-62a1	Steps 8-19a1of the generic procedure (TS 38.508-1 Table 4.5.2.2-2 [4]) are executed to successfully complete the registration procedure.	-	-	-	-

9.1.1.4.3.3 Specific message contents

Table 9.1.1.4.3.3-1: AUTHENTICATION RESPONSE (step 8, step 29 and step 50 , Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-2			
Information Element	Value/remark	Comment	Condition
Authentication response parameter	RES* equal to the XRES* calculated in the SS with the parameters provided/indicated in the AUTHENTICATION REQUEST		

Table 9.1.1.4.3.3-2: AUTHENTICATION REQUEST (step 5, Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-1			
Information Element	Value/remark	Comment	Condition
Authentication parameter AUTN	Invalid MAC	SS shall calculate the correct MAC value as specified in TS 33.102 and use any different value, e.g. correct_MAC+5.	

Table 9.1.1.4.3.3-3: AUTHENTICATION FAILURE (step 6, Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-4			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 0100'B	MAC failure	

Table 9.1.1.4.3.3-4: AUTHENTICATION REQUEST (step 26, Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-1			
Information Element	Value/remark	Comment	Condition

Authentication parameter AUTN	"separation bit"=0	The "separation bit" in the AMF field of AUTN supplied by the core network is 0.	
-------------------------------	--------------------	--	--

Table 9.1.1.4.3.3-5: AUTHENTICATION FAILURE (step 27, Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-4			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 1010'B	Non-5G authentication unacceptable	

Table 9.1.1.4.3.3-6: AUTHENTICATION REQUEST (step 47, Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-1			
Information Element	Value/remark	Comment	Condition
Authentication parameter AUTN	AMF field set to "AMF <sub>RESYNCH</sub> ", AMF <sub>RESYNCH</sub> = '1111 1111 1111 1111'B	AMF <sub>RESYNCH</sub> see TS 34.108, 8.1.2.2	

Table 9.1.1.4.3.3-7: AUTHENTICATION FAILURE (step 48, Table 9.1.1.4.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-4			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 0101'B	Synch failure	
Authentication failure parameter	AUTS	AUTS see TS 34.108, 8.1.2.2	

9.1.1.5            5G AKA based primary authentication and key agreement / Reject

9.1.1.5            Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED-INITIATED state and SS initiates a 5G AKA based primary authentication and key agreement procedure }

ensure that {

    when { the SS sends an a AUTHENTICATION REJECT message }

        then { the UE deletes the stored 5G-GUTI, last visited registered TAI and ngKSI and enter state 5GMM-DEREGISTERED, the USIM is considered invalid until switching off the UE. }

}

### 9.1.1.5.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.4.1.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.1.3.5]

If the authentication response (RES) returned by the UE is not valid, the network response depends upon the type of identity used by the UE in the initial NAS message, that is:

- if the 5G-GUTI was used; or
- if the SUCI was used.

If the 5G-GUTI was used, the network should initiate an identification procedure to retrieve SUCI from the UE and restart the 5G AKA based primary authentication and key agreement procedure with the received SUCI.

If the SUCI was used for identification in the initial NAS message or in a restarted 5G AKA based primary authentication and key agreement procedure, or the network decides not to initiate the identification procedure to retrieve SUCI from the UE after an unsuccessful 5G AKA based primary authentication and key agreement procedure, the network should send an AUTHENTICATION REJECT message to the UE.

Upon receipt of an AUTHENTICATION REJECT message,

- 1) if the message has been successfully integrity checked by the NAS, the UE shall set the update status to 5U3 ROAMING NOT ALLOWED, delete the stored 5G-GUTI, TAI list, last visited registered TAI and ngKSI.

In case of PLMN, the USIM shall be considered invalid until switching off the UE or the UICC containing the USIM is removed. In case of SNPN, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN shall be considered invalid until the UE is switched off or the entry is updated.

- The UE shall set:

- i) the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "SIM/USIM considered invalid for 5GS services over non-3GPP access" events in case of PLMN; or
- ii) the counter for "the entry for the current SNPN considered invalid for 3GPP access" events in case of SNPN;

to UE implementation-specific maximum value. If the UE maintains a counter for "SIM/USIM considered invalid for non-GPRS services", then the UE shall set this counter to UE implementation-specific maximum value; and

- if the UE is operating in single-registration mode, the UE shall handle 4G-GUTI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the authentication procedure is not accepted by the network. The USIM shall be considered as invalid also for non-EPS services until switching off or the UICC containing the USIM is removed.
- 2) if the message is received without integrity protection, the UE shall start timer T3247 with a random value uniformly drawn from the range between 30 minutes and 60 minutes, if the timer is not running (see subclause 5.3.20). Additionally, the UE shall:
    - a) if the message is received over 3GPP access, and the counter for "SIM/USIM considered invalid for GPRS services" events or the counter for "the entry for the current SNPN considered invalid for 3GPP access" events has a value less than a UE implementation-specific maximum value, proceed as specified in subclause 5.3.20, list item 1)-a) of clause 5.3.20.2 (if the UE is not SNPN enabled or is not operating in SNPN access mode) or list item a) of clause 5.30.20.3 (if the UE is operating in SNPN access mode) for the case that the 5GMM cause value received is #3;

- b) if the message is received over non-3GPP access, and the counter for "SIM/USIM considered invalid for 5GS services over non-3GPP access" events has a value less than a UE implementation-specific maximum value, proceed as specified in subclause 5.3.20, list item 1)-b) of clause 5.3.20.2 for the case that the 5GMM cause value received is #3.
  - c) otherwise
    - i) if the 5GMM cause value is received over 3GPP access, the UE shall:
      - set the update status for 3GPP access to 5U3 ROAMING NOT ALLOWED, delete for 3GPP access only the stored 5G-GUTI, TAI list, last visited registered TAI and ngKSI. The USIM shall be considered invalid for 5GS services via 3GPP access and non-EPS service until switching off the UE or the UICC containing the USIM is removed or the entry of the "list of subscriber data" with the SNPN identity of the current SNPN shall be considered invalid for 3GPP access until the UE is switched off or the entry is updated.
      - The UE shall set the counter for "SIM/USIM considered invalid for GPRS services" events or the counter for "the entry for the current SNPN considered invalid for 3GPP access" events to UE implementation-specific maximum value. If the UE maintains a counter for "SIM/USIM considered invalid for non-GPRS services", then the UE shall set this counter to UE implementation-specific maximum value.
      - If the UE is operating in single-registration mode, the UE shall handle 4G-GUTI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the authentication procedure is not accepted by the network. The USIM shall be considered as invalid also for non-EPS services until switching off or the UICC containing the USIM is removed; and
    - ii) if the 5GMM cause value is received over non-3GPP access, the UE shall:
      - set the update status for non-3GPP access to 5U3 ROAMING NOT ALLOWED, delete for non-3GPP access only the stored 5G-GUTI, TAI list, last visited registered TAI and ngKSI. The USIM shall be considered invalid for 5GS services via non-3GPP access until switching off the UE or the UICC containing the USIM is removed.
- The UE shall set the counter for "SIM/USIM considered invalid for 5GS services over non-3GPP access" events to UE implementation-specific maximum value.

If the AUTHENTICATION REJECT message is received by the UE, the UE shall abort any 5GMM signalling procedure, stop any of the timers T3510, T3516, T3517, T3519 or T3521 (if they were running), enter state 5GMM-DEREGISTERED and delete any stored SUCI.

Depending on local requirements or operator preference for emergency services, if the UE initiates a registration procedure with 5GS registration type IE set to "emergency registration" and the AMF is configured to allow emergency registration without user identity, the AMF needs not follow the procedures specified for the authentication failure in the present subclause. The AMF may continue a current 5GMM specific procedure.

**9.1.1.5.3                    Test description**

**9.1.1.5.3.1                Pre-test conditions**

**System Simulator:**

- NGC Cell A "Serving cell" TS 38.508-1 [4] Table 6.2.2.1-3

**UE:**

-None

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.1.5.3.2 Test procedure sequence

Table 9.1.1.5.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on.	-	-	-	-
2-4	The UE executes steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
5	The SS transmits an AUTHENTICATION REQUEST message		5GMM: AUTHENTICATION REQUEST	-	-
6	The UE transmits an AUTHENTICATION RESPONSE		5GMM: AUTHENTICATION RESPONSE	-	-
7	The SS transmits an AUTHENTICATION REJECT message	<--	5GMM: AUTHENTICATION REJECT	-	-
8	SS releases the RRC connection	-	-	-	-
9	Check: Does the UE transmit an RRCSetupRequest message for initial registration procedure within the next 30 seconds?	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
10	The UE is switched off by executing generic procedure in Table 4.9.6.4-1 in TS 38.508-1 [4].	-	-	-	-
11	The UE is switched on.	-	-	-	-
12	Check: Does the UE transmit a REGISTRATION REQUEST message?	-->	5GMM: REGISTRATION REQUEST	1	P
13-28a1	The UE executes steps 5-20a1 of Table 4.5.2.2-2 in TS 38.508-1 [4] complete registration procedure.	-	-	-	-

9.1.1.5.3.3 Specific message contents

Table 9.1.1.5.3.3-1: REGISTRATION REQUEST (step 4, Table 9.1.1.5.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type			
5GS registration type value	'001'B	initial registration	

Table 9.1.1.5.3.3-2: REGISTRATION REQUEST (step 12, Table 9.1.1.5.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition

5GS registration type			
5GS registration type value	'001'B	initial registration	
ngKSI	'111'	no key is available	
5GS mobile identity	SUCI of the UE	a freshly generated SUCI	
Last visited registered TAI	Not present		

### 9.1.1.6 5G AKA based primary authentication and key agreement / Abnormal

#### 9.1.1.6 Test Purpose (TP)

##### (1)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS initiates a 5G AKA based primary authentication and key agreement procedure by
    sending AUTHENTICATION REQUEST with ngKSI is already in use }

    then { the UE sends an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #71
    "ngKSI already in use" }

}
```

##### (2)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the third time SS initiates 5G AKA based primary authentication and key agreement procedure
    by sending AUTHENTICATION REQUEST with ngKSI is already in use }

    then { the UE locally releases the RRC connection and treats the active cell as barred }

}
```

##### (3)

```
with { the UE in 5GMM-REGISTERED-INITIATED state, the SS sends an AUTHENTICATION REQUEST with ngKSI
is already in use and the UE sends an AUTHENTICATION FAILURE message }

ensure that {

    when { T3520 times out }

    then { the UE locally releases the RRC connection and treats the active cell as barred }

}
```

##### (4)

Void

(5)

**with** { the UE in 5GMM-REGISTERED state and initiates a mobility registration update procedure }

**ensure that** {

**when** { the SS initiates a 5G AKA based primary authentication and key agreement procedure by sending AUTHENTICATION REQUEST and the UE fails on transmission of AUTHENTICATION RESPONSE message with the indication from lower layers }

**then** { the UE re-initiate the mobility registration update procedure }

}

**9.1.1.6.2 Conformance requirements**

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.4.1.3.7.  
Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.1.3.7]

e) Authentication failure (5GMM cause #71 "ngKSI already in use").

The UE shall send an AUTHENTICATION FAILURE message, with 5GMM cause #71 "ngKSI already in use", to the network and start the timer T3520 (see example in figure 5.4.1.3.7.1). Furthermore, the UE shall stop any of the retransmission timers that are running (e.g. T3510, T3517 or T3521). Upon the first receipt of an AUTHENTICATION FAILURE message from the UE with 5GMM cause #71 "ngKSI already in use", the network performs necessary actions to select a new ngKSI and send the same 5G authentication challenge to the UE.

...

g) Network failing the authentication check.

If the UE deems that the network has failed the authentication check, then it shall request RRC to locally release the RRC connection and treat the active cell as barred (see 3GPP TS 38.304 [28]). The UE shall start any retransmission timers (e.g. T3510, T3517 or T3521), if they were running and stopped when the UE received the first AUTHENTICATION REQUEST message containing an incorrect authentication challenge data causing authentication failure.

h) Transmission failure of AUTHENTICATION RESPONSE message or AUTHENTICATION FAILURE message indication from lower layers (if the 5G AKA based primary authentication and key agreement procedure is triggered by a registration procedure for mobility and periodic registration update).

The UE shall stop the timer T3520, if running, and re-initiate the registration procedure for mobility and periodic registration update.

...

i) Transmission failure of AUTHENTICATION RESPONSE message or AUTHENTICATION FAILURE message indication with TAI change from lower layers (if the 5G AKA based primary authentication and key agreement procedure is triggered by a service request procedure).

The UE shall stop the timer T3520, if running.

If the current TAI is not in the TAI list, the 5G AKA based primary authentication and key agreement procedure shall be aborted and a registration procedure for mobility and periodic registration update shall be initiated.

If the current TAI is still part of the TAI list, it is up to the UE implementation how to re-run the ongoing procedure that triggered the 5G AKA based primary authentication and key agreement procedure.

...

For items c, d, e, and f whether or not the UE is registered for emergency services:

...

The UE shall deem that the network has failed the authentication check or assume that the authentication is not genuine and proceed as described in item g above if any of the following occurs:

- the timer T3520 expires;
- the UE detects any combination of the 5G authentication failures: 5GMM causes #20 "MAC failure", #21 "synch failure", #26 "non-5G authentication unacceptable" or #71 "ngKSI already in use", during three consecutive authentication challenges. The 5G authentication challenges shall be considered as consecutive only, if the 5G authentication challenges causing the second and third 5G authentication failure are received by the UE, while the timer T3520 started after the previous 5G authentication failure is running.

9.1.1.6.3

Test description

9.1.1.6.3.1

Pre-test conditions

System Simulator:

- NGC Cell A, NGC Cell B, NGC Cell C and NGC Cell D are configured according to table 6.3.2.2-1 in TS 38.508-1 [4].
- The SS configures the NGC Cell A as the "Serving cell" and other NGC Cells as "Non-suitable "Off" cell".
- System information combination NR-2 as defined in TS 38.508-1 [4] clause 4.4.3.1.2 is used.

UE:

- None.

Preamble:

- The UE is in test state 0N-B on NGC Cell A according to TS 38.508-1 [4]. The ngKSI-1 has been assigned and security context has been established.

9.1.1.6.3.2

Test procedure sequence

Table 9.1.1.6.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		



-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
0	The UE is switched on.	-	-	-	-
0A	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4] and transmits a REGISTRATION REQUEST message.	-->	5GMM: REGISTRATION REQUEST	-	-
1	The SS initiates a 5G AKA based primary authentication and key agreement procedure by sending AUTHENTICATION REQUEST with ngKSI is already in use (ngKSI-1).	<--	5GMM: AUTHENTICATION REQUEST	-	-
2	Check: Does the UE send an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #71 "ngKSI already in use"?	-->	5GMM: AUTHENTICATION FAILURE	1	P
3	The SS initiates a 5G AKA based primary authentication and key agreement procedure by sending AUTHENTICATION REQUEST with ngKSI is already in use (ngKSI-1).	<--	5GMM: AUTHENTICATION REQUEST	-	-
4	Check: Does the UE send an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #71 "ngKSI already in use"?	-->	5GMM: AUTHENTICATION FAILURE	1	P
5	Void	-	-	-	-
6	The SS initiates a 5G AKA based primary authentication and key agreement procedure by sending AUTHENTICATION REQUEST with ngKSI is already in use (ngKSI-1).	<--	5GMM: AUTHENTICATION REQUEST	-	-
6a1	EXCEPTION: The UE may send an AUTHENTICATION FAILURE before locally releasing the RRC Connection.	-->	5GMM: AUTHENTICATION FAILURE	-	-
6A	Check: Does the UE transmit a RRCSetupRequest on NGC Cell A in the next 30 seconds? (Note 1)	-->	5G RRC: RRCSetupRequest	2	F
6B	The SS configures: -NGC Cell B as the "Serving cell". -NGC Cell A as a "Suitable neighbour intra-frequency cell".	-	-	-	-
-	The following messages are to be observed on NGC Cell B unless explicitly stated otherwise.	-	-	-	-
7-9	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
10	Check: Does the UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as initial registration?	-->	5GMM: REGISTRATION REQUEST	2	P
11	The SS initiates a 5G AKA based primary authentication and key agreement procedure by sending AUTHENTICATION REQUEST with ngKSI is already in use (ngKSI-1).	<--	5GMM: AUTHENTICATION REQUEST	-	-
12	The UE sends an AUTHENTICATION FAILURE message to the network, with the 5GMM cause #71 "ngKSI already in use".	-->	5GMM: AUTHENTICATION FAILURE	-	-
12 A	SS starts timer of t_Wait= T3520.	-	-	-	-
13	Void	-	-	-	-
14	SS waits for the expiration of t_Wait.	-	-	-	-
14 A	Check: Does the UE transmit a RRCSetupRequest on NGC Cell B in the next 30 seconds? (Note 1)	-->	5G RRC: RRCSetupRequest	2	F

14 B	The SS configures: -NGC Cell C as the "Serving cell". -NGC Cell B as a "Suitable neighbour intra-frequency cell". -NGC Cell A as a "Non-suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NGC Cell C unless explicitly stated otherwise.	-	-	-	-
15- 17	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
18	Check: Does the UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as initial registration?	-->	5GMM: REGISTRATION REQUEST	3	P
19- 34a 1	Steps 5-20a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
35- 39	Void				
40	The SS configures: - NGC Cell D as the "Serving cell". - NGC Cell C as a "Non-suitable "Off" cell ". - NGC Cell B as a "Non-suitable "Off" cell ".	-	-	-	-
41- 42	Void				
-	The following messages are to be observed on NGC Cell D unless explicitly stated otherwise.	-	-	-	-
43- 45	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
46	The UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE setting as Mobility registration updating.	-->	5GMM: REGISTRATION REQUEST	-	-
47	The SS cuts off the UL grant and RA Response, so that the UE cannot send the AUTHENTICATION RESPONSE to SS.	-	-	-	-
48	SS transmits an AUTHENTICATION REQUEST message with ngKSI-2 to initiate the 5G-AKA procedure.	<--	5GMM: AUTHENTICATION REQUEST	-	-
49	SS starts timer of t_Delay =10s. (Note2).	-	-	-	-
50	SS performs local release.	-	-	-	-
51	Check whether t_Delay is still running, if it's running, then waiting for timeout.	-	-	-	-
52	SS configures the RA Response.	-	-	-	-
53	Check: Does the test result of generic test procedure in TS 38.508-1 [4] subclause 4.9.5 indicate that the UE is camped on NGC Cell D, with 'connected without release'?	-	-	5	P
Note 1: If the cell is not barred, after the transmission of REGISTRATION REQUEST, the UE will start T3510 and T3511. After 25s (T3510+T3511), the UE shall send REGISTRATION REQUEST.					
Note 2: To send the AUTHENTICATION RESPONSE, the UE will initiate RACH to get UL grant. Since there is no RA Response, registration failure due to lower layer failure will occur, then T3511 will start. Timer t_Delay is derived from T3511. During timer t_Delay, UE fails on transmission of AUTHENTICATION RESPONSE message with the indication from lower layers.					

9.1.1.6.3.3

Specific message contents

Table 9.1.1.6.3.3-1: AUTHENTICATION REQUEST (step 1, step 3, step 6 and step 11, Table 9.1.1.6.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
ngKSI	ngKSI-1	The same with the ng-KSI assigned in Preamble.	

Table 9.1.1.6.3.3-2: AUTHENTICATION FAILURE (step 2, step 4, step 6a1 and step 12, Table 9.1.1.6.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-4			
Information Element	Value/Remark	Comment	Condition
5GMM cause	'0100 0111'B	ngKSI already in use	

Table 9.1.1.6.3.3-3: AUTHENTICATION REQUEST (step 48, Table 9.1.1.6.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
ngKSI	ngKSI-2	Different from the ng-KSI assigned in step 19	

Table 9.1.1.6.3.3-4: REGISTRATION REQUEST (step 10 and step 18, Table 9.1.1.6.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type			
5GS registration type value	'001'B	initial registration	

Table 9.1.1.6.3.3-5: REGISTRATION REQUEST (step 46, Table 9.1.1.6.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type			
5GS registration type value	'010'B	mobility registration updating	

9.1.2 Security mode control

9.1.2.1 NAS security mode command

9.1.2.1.1 Test Purpose (TP)

(1)

**with** { the UE is in 5GMM-REGISTERED-INITIATED state and the SS initiates the NAS security mode control procedure by sending a SECURITY MODE COMMAND message during initial registration procedure }  
  
**ensure that** {  
  
    **when** { the UE receives an integrity protected SECURITY MODE COMMAND message including not matching replayed security capabilities }  
  
    **then** { the UE send a SECURITY MODE REJECT message and does not start applying the NAS security in both UL and DL }  
  
}

(2)

**with** { the UE is in 5GMM-REGISTERED-INITIATED state and the SS initiates the NAS security mode control procedure by sending a SECURITY MODE COMMAND message during initial registration procedure }  
  
**ensure that** {  
  
    **when** { the UE receives an integrity protected SECURITY MODE COMMAND message including IMEISV request }  
  
    **then** { the UE send an integrity protected and ciphered SECURITY MODE COMPLETE message including IMEISV **and** starts applying the NAS Security in both UL and DL }  
  
}

9.1.2.1.2 Conformance requirements

References: The conformance requirements covered in the present test case are specified in: TS 24.501, clauses 5.4.2.1, 5.4.2.3 and 5.4.2.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.2.1]

The purpose of the NAS security mode control procedure is to take a 5G NAS security context into use, and initialise and start NAS signalling security between the UE and the AMF with the corresponding 5G NAS keys and 5G NAS security algorithms.

Furthermore, the network may also initiate the security mode control procedure in the following cases:

- a) in order to change the 5G NAS security algorithms for a current 5G NAS security context already in use;
- b) in order to change the value of uplink NAS COUNT used in the latest SECURITY MODE COMPLETE message as described in 3GPP TS 33.501 [24], subclause 6.9.4.4.
- c) in order to provide the Selected EPS NAS security algorithms to the UE.

For restrictions concerning the concurrent running of a security mode control procedure with other security related procedures in the AS or inside the core network see 3GPP TS 33.501 [24], subclause 6.9.5.

[TS 24.501, clause 5.4.2.3]

Upon receipt of the SECURITY MODE COMMAND message, the UE shall check whether the security mode command can be accepted or not. This is done by performing the integrity check of the message, and by checking that the received Replayed UE security capabilities IE has not been altered compared to the latest values that the UE sent to the network.

When the SECURITY MODE COMMAND message includes an EAP-success message the UE handles the EAP-success message and the ABBA as described in subclause 5.4.1.2.2.8 and 5.4.1.2.3.1.

If:

- a) the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session; or
- b) the W-AGF acts on behalf of the FN-RG;

and the SECURITY MODE COMMAND message is received with ngKSI value "000" and 5G-IA0 and 5G-EA0 as selected 5G NAS security algorithms, the UE shall locally derive and take in use 5G NAS security context. The UE shall delete existing current 5G NAS security context.

The UE shall accept a SECURITY MODE COMMAND message indicating the "null integrity protection algorithm" 5G-IA0 as the selected 5G NAS integrity algorithm only if the message is received when the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session or when the W-AGF acts on behalf of the FN-RG.

If the type of security context flag included in the SECURITY MODE COMMAND message is set to "native security context" and if the ngKSI matches a valid non-current native 5G NAS security context held in the UE while the UE has a mapped 5G NAS security context as the current 5G NAS security context, the UE shall take the non-current native 5G NAS security context into use which then becomes the current native 5G NAS security context and delete the mapped 5G NAS security context.

The UE shall ignore the Replayed S1 UE security capabilities IE if this IE is included in the SECURITY MODE COMMAND message.

If the SECURITY MODE COMMAND message can be accepted, the UE shall take the 5G NAS security context indicated in the message into use. The UE shall in addition reset the uplink NAS COUNT counter if:

- a) the SECURITY MODE COMMAND message is received in order to take a 5G NAS security context into use created after a successful execution of the 5G AKA based primary authentication and key agreement procedure or the EAP based primary authentication and key agreement procedure; or
- b) the SECURITY MODE COMMAND message received includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE the ngKSI does not match the current 5G NAS security context, if it is a mapped 5G NAS security context.

If the SECURITY MODE COMMAND message can be accepted and a new 5G NAS security context is taken into use and SECURITY MODE COMMAND message does not indicate the "null integrity protection algorithm" 5G-IA0 as the selected NAS integrity algorithm, the UE shall:

- if the SECURITY MODE COMMAND message has been successfully integrity checked using an estimated downlink NAS COUNT equal to 0, then the UE shall set the downlink NAS COUNT of this new 5G NAS security context to 0;

- otherwise the UE shall set the downlink NAS COUNT of this new 5G NAS security context to the downlink NAS COUNT that has been used for the successful integrity checking of the SECURITY MODE COMMAND message.

If the SECURITY MODE COMMAND message includes the horizontal derivation parameter indicating " $K_{AMF}$  derivation is required", the UE shall derive a new  $K'_{AMF}$ , as specified in 3GPP TS 33.501 [24] for  $K_{AMF}$  to  $K'_{AMF}$  derivation in mobility, and set both uplink and downlink NAS COUNTs to zero. When the new 5G NAS security context is taken into use for current access and the UE is registered with the same PLMN over the 3GPP access and the non-3GPP access:

- a) the UE is in 5GMM-IDLE mode over the non-current access, the AMF and the UE shall activate the new 5G NAS security context over the non-current access as described in 3GPP TS 33.501 [24]. The AMF and the UE shall set the downlink NAS COUNT and uplink NAS COUNT to zero for the non-current access; or
- b) the UE is in 5GMM-CONNECTED mode over the non-current access, the AMF shall send the SECURITY MODE COMMAND message over the non-current access to activate the new 5G NAS security context that was activated over the current access as described in 3GPP TS 33.501 [24]. The AMF shall include the same ngKSI in the SECURITY MODE COMMAND message to identify the new 5G NAS security context.

If the SECURITY MODE COMMAND message includes the horizontal derivation parameter indicating " $K_{AMF}$  derivation is not required" or the Additional 5G security parameters IE is not included in the message, the UE is registered with the same PLMN over the 3GPP access and non-3GPP access, then after the completion of a security mode control procedure over the current access:

- a) the UE is in 5GMM-IDLE mode over the non-current access, the AMF and the UE shall activate the new 5G NAS security context for the non-current access. If a primary authentication and key agreement procedure was completed before the security mode control procedure, the AMF and the UE shall set the downlink NAS COUNT and uplink NAS COUNT to zero for the non-current access, otherwise the downlink NAS COUNT and uplink NAS COUNT for the non-3GPP access are not changed; or
- b) the UE is in 5GMM-CONNECTED mode over the non-current access, the AMF shall send the SECURITY MODE COMMAND message over the non-current access to activate the new 5G NAS security context that was activated over the current access as described in 3GPP TS 33.501 [24]. The AMF shall include the same ngKSI in the SECURITY MODE COMMAND message to identify the new 5G NAS security context.

If the SECURITY MODE COMMAND message can be accepted, the UE shall send a SECURITY MODE COMPLETE message integrity protected with the selected 5GS integrity algorithm and the 5G NAS integrity key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  if the type of security context flag is set to "mapped security context" indicated by the ngKSI. When the SECURITY MODE COMMAND message includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE, then the UE shall check whether the SECURITY MODE COMMAND message indicates the ngKSI of the current 5GS security context, if it is a mapped 5G NAS security context, in order not to re-generate the  $K'_{AMF}$ .

Furthermore, if the SECURITY MODE COMMAND message can be accepted, the UE shall cipher the SECURITY MODE COMPLETE message with the selected 5GS ciphering algorithm and the 5GS NAS ciphering key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  indicated by the ngKSI. The UE shall set the security header type of the message to "integrity protected and ciphered with new 5G NAS security context".

From this time onward the UE shall cipher and integrity protect all NAS signalling messages with the selected 5GS integrity and ciphering algorithms.

If the AMF indicated in the SECURITY MODE COMMAND message that the IMEISV is requested:

- 1) if the UE has an IMEISV, the UE shall include its IMEISV in the SECURITY MODE COMPLETE message; or

2) if the 5G-CRG or the W-AGF acting on behalf of the FN-CRG do not have an IMEISV, the 5G-CRG or the W-AGF acting on behalf of the FN-CRG shall include the 5G-CRG's cable modem MAC address or the FN-CRG's cable modem MAC address in the SECURITY MODE COMPLETE message.

If, during an ongoing registration procedure or service request procedure, the SECURITY MODE COMMAND message includes the Additional 5G security information IE with the RINMR bit set to "Retransmission of the initial NAS message requested", the UE shall include the entire uncyphered REGISTRATION REQUEST message or SERVICE REQUEST message, which the UE had previously included in the NAS message container IE of the initial NAS message (i.e. REGISTRATION REQUEST message or SERVICE REQUEST message, respectively), in the NAS message container IE of the SECURITY MODE COMPLETE message.

If, prior to receiving the SECURITY MODE COMMAND message, the UE without a valid 5G NAS security context had sent a REGISTRATION REQUEST message the UE shall include the entire REGISTRATION REQUEST message in the NAS message container IE of the SECURITY MODE COMPLETE message as described in subclause 4.4.6.

If the UE operating in the single-registration mode receives the Selected EPS NAS security algorithms IE, the UE shall use the IE according to 3GPP TS 33.501 [24].

For a UE operating in single-registration mode with N26 interface supported in the network, after an inter-system change from S1 mode to N1 mode in 5GMM-CONNECTED mode, the UE shall set the value of the Selected EPS NAS security algorithms IE in the 5G NAS security context to the NAS security algorithms that were received from the source MME when the UE was in S1 mode.

[TS 24.501, clause 5.4.2.5]

If the security mode command cannot be accepted, the UE shall send a SECURITY MODE REJECT message. The SECURITY MODE REJECT message contains a 5GMM cause that typically indicates one of the following cause values:

- #23 UE security capabilities mismatch.
- #24 security mode rejected, unspecified.

If the UE detects that the received Replayed UE security capabilities IE has been altered compared to the latest values that the UE sent to the network, the UE shall set the cause value to #23 "UE security capabilities mismatch".

Upon receipt of the SECURITY MODE REJECT message, the AMF shall stop timer T3560. The AMF shall also abort the ongoing procedure that triggered the initiation of the NAS security mode control procedure.

Both the UE and the AMF shall apply the 5G NAS security context in use before the initiation of the security mode control procedure, if any, to protect the SECURITY MODE REJECT message and any other subsequent messages according to the rules in subclause 4.4.4 and 4.4.5.

**9.1.2.1.3            Test description**

**9.1.2.1.3.1        Pre-test conditions**

**System Simulator:**

- NGC Cell A.

**UE:**

- None.

Preamble:

- The procedure defined in subclause 4.9.8 in 38.508-1 [4] has been performed to ensure that the UE does not have a valid 5G NAS security context
- The UE is in state 0-A on NGC Cell A according to TS 38.508-1 [4].

9.1.2.1.3.2 Test procedure sequence

Table 9.1.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on.	-	-	-	-
2-2E	Steps 1-6 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
3	The SS transmits a SECURITY MODE COMMAND message to activate NAS security. It is integrity protected and includes unmatched replayed security capabilities.	<--	SECURITY MODE COMMAND	-	-
4	Check: Does the UE transmit a SECURITY MODE REJECT message with cause'#23: UE security capabilities mismatch'?	-->	SECURITY MODE REJECT	1	P
5	The SS transmits an IDENTITY REQUEST message (Security not applied).	<--	IDENTITY REQUEST	-	-
6	Check: Does the UE transmit a non security protected IDENTIY RESPONSE message?	-->	IDENTITY RESPONSE	1	P
7	The SS transmits a SECURITY MODE COMMAND message to activate NAS security. It is integrity protected and includes IMEISV.	<--	SECURITY MODE COMMAND	-	-
8	Check: Does the UE transmit a SECURITY MODE COMPLETE message and does it establish the initial security configuration?	-->	SECURITY MODE COMPLETE	2	P
9a1-9Ja1	Steps 9a1-19a1 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
10	The SS transmits an IDENTITY REQUEST message (Security protected as per the algorithms specified in step 7).	<-	IDENTITY REQUEST	-	-
11	Check: Does the UE transmit an IDENTIY RESPONSE message (Security Protected as per the algorithms specified in step 7)?	->	IDENTITY RESPONSE	2	P

9.1.2.1.3.3 Specific message contents

Table 9.1.2.1.3.3-1: SECURITY MODE COMMAND (Step 3, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Replayed UE security capabilities	Set to mismatch the security capability of UE under test		



Table 9.1.2.1.3.3-2: SECURITY MODE REJECT (Step 4, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-27			
Information Element	Value/Remark	Comment	Condition
5GMM cause	#23		

Table 9.1.2.1.3.3-3: IDENTITY REQUEST (Step 5, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-21			
Information Element	Value/Remark	Comment	Condition
Identity type	'0001'B	SUCI	

Table 9.1.2.1.3.3-4: IDENTITY RESPONSE (Step 6, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-22			
Information Element	Value/Remark	Comment	Condition
Mobile identity			
Type of identity	'001'B	SUCI	

Table 9.1.2.1.3.3-5: SECURITY MODE COMMAND (Step 7, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of ciphering algorithm	Set according to PIXIT parameter for default ciphering algorithm if it is set to a value different to 5G-EA0, or, set to any value different to 5G-EA0 otherwise	Non-zero ciphering algorithm	
IMEISV request	Present		

Table 9.1.2.1.3.3-6: SECURITY MODE COMPLETE (Step 8, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-26			
Information Element	Value/Remark	Comment	Condition
IMEISV	Present		

Table 9.1.2.1.3.3-7: IDENTITY REQUEST (Step 10, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-21			
Information Element	Value/Remark	Comment	Condition
Identity type	'0011'B	IMEI	

Table 9.1.2.1.3.3-8: IDENTITY RESPONSE (Step 11, Table 9.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-22			
Information Element	Value/Remark	Comment	Condition

Mobile identity			
Type of identity	'011'B	IMEI	

9.1.2.2          Protection of initial NAS signalling messages

9.1.2.2.1          Test Purpose (TP)

(1)

with { the UE is switched-off with no valid 5G NAS security context }

ensure that {

    when { the UE is switched on }

        then {the UE sends a REGISTRATION REQUEST message including cleartext IEs only }

    }

(2)

with { the UE is in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the UE is activating a 5G NAS security context resulting from a security mode control procedure }

        then {the UE sends SECURITY MODE COMPLETE message with the entire REGISTRATION REQUEST message }

    }

9.1.2.2.2          Conformance requirements

References: The conformance requirements covered in the present test case are specified in: TS 24.501, clauses 4.4.6 and 5.5.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.4.6]

The 5GS supports protection of initial NAS messages as specified in 3GPP TS 33.501 [24]. The protection of initial NAS messages applies to the REGISTRATION REQUEST and SERVICE REQUEST message, and is achieved as follows:

- a) If the UE does not have a valid 5G NAS security context, the UE sends a REGISTRATION REQUEST message including cleartext IEs only. After activating a 5G NAS security context resulting from a security mode control procedure:
  - 1) if the UE needs to send non-cleartext IEs, the UE shall include the entire REGISTRATION REQUEST message (i.e. containing both cleartext IEs and non-cleartext IEs) in the NAS message container IE and shall include the NAS message container IE in the SECURITY MODE COMPLETE message;
  - 2) if the UE does not need to send non-cleartext IEs, the UE shall include the entire REGISTRATION REQUEST message (i.e. containing cleartext IEs only) in the NAS message container IE and shall include the NAS message container IE in the SECURITY MODE COMPLETE message.

b) If the UE has a valid 5G NAS security context and the UE needs to send non-cleartext IEs in a REGISTRATION REQUEST or SERVICE REQUEST message, the UE includes the entire REGISTRATION REQUEST or SERVICE REQUEST message (i.e. containing both cleartext IEs and non-cleartext IEs) in the NAS message container IE and shall cipher the value part of the NAS message container IE. The UE shall then send a REGISTRATION REQUEST or SERVICE REQUEST message containing the cleartext IEs and the NAS message container IE.

When the initial NAS message is a REGISTRATION REQUEST message, the cleartext IEs are:

- Extended protocol discriminator;
- Security header type;
- Spare half octet;
- Registration request message identity;
- 5GS registration type;
- ngKSI;
- 5GS mobile identity;
- UE security capability;
- Additional GUTI;
- UE status; and
- EPS NAS message container.

...

When the UE sends a REGISTRATION REQUEST or SERVICE REQUEST message that includes a NAS message container IE, the UE shall set the security header type of the initial NAS message to "integrity protected".

If the UE does not need to send non-cleartext IEs in the initial NAS message, the UE shall send the initial NAS message i.e. REGISTRATION REQUEST or SERVICE REQUEST message with cleartext IEs only i.e. without including the NAS message container IE in the initial NAS message.

[TS 24.501, clause 5.5.1]

...

If the UE does not have a valid 5G NAS security context, the UE shall send the REGISTRATION REQUEST message without including the NAS message container IE. The UE shall include the entire REGISTRATION REQUEST message (i.e. containing cleartext IEs and non-cleartext IEs) in the NAS message container IE that is sent as part of the SECURITY MODE COMPLETE message as described in subclauses 4.4.6 and 5.2.4.

**9.1.2.2.3            Test description**

**9.1.2.2.3.1        Pre-test conditions**

**System Simulator:**

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 0-A on NGC Cell A according to TS 38.508-1 [4].
- The procedure defined in subclause 4.9.8 in TS 38.508-1 [4] has been performed to ensure that the UE does not have a valid 5G NAS security context.

9.1.2.2.3.2            Test procedure sequence

Table 9.1.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on.	-	-	-	-
2-4	Steps 1-3 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
5	Check: Does he UE transmit an <i>RRSetupComplete</i> message and a REGISTRATION REQUEST message?	-->	REGISTRATION REQUEST	1	P
6	The SS transmits a <i>DLInformationTransfer</i> message and an AUTHENTICATION REQUEST message.	<--	AUTHENTICATION REQUEST		
7	The UE transmits an <i>ULInformationTransfer</i> message and an AUTHENTICATION RESPONSE message.	-->	AUTHENTICATION RESPONSE		
8	The SS transmits a <i>DLInformationTransfer</i> message and a SECURITY MODE COMMAND message.	<--	SECURITY MODE COMMAND		
9	Check: Does the UE transmit an <i>ULInformationTransfer</i> message and a SECURITY MODE COMPLETE message?	-->	SECURITY MODE COMPLETE	2	P
10-20	Steps 10-20a1 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-

9.1.2.2.3.3            Specific message contents

Table 9.1.2.2.3.3-1: REGISTRATION REQUEST (Step 5, Table 9.1.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6 using condition NON_CLEARTEXT_IE = FALSE
--

Table 9.1.2.2.3.3-2: REGISTRATION REQUEST (Step 9, Table 9.1.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6 using condition CIPHERED_MESSAGE
--

Table 9.1.2.2.3.3-3: SECURITY MODE COMPLETE (Step 9, Table 9.1.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-26			
Information Element	Value/Remark	Comment	Condition

NAS message container	Contents of Table 9.1.2.2.3.3-2	The entire REGISTRATION REQUEST message.	
-----------------------	---------------------------------	--	--

9.1.2.3 Integrity protection / Correct functionality of 5G NAS integrity algorithm / SNOW3G

9.1.2.3.1 Test Purpose (TP)

(1)

with { successful completion of 5G authentication and key agreement (AKA) procedure }

ensure that {

    when { UE receives a an integrity protected SECURITY MODE COMMAND message instructing to start integrity protection using algorithm SNOW3G }

    then { UE transmits an integrity protected SECURITY MODE COMPLETE using SNOW3G and starts applying the NAS Integrity protection in both UL and DL }

    }

(2)

with { Integrity protection successful started by executing Security Mode Procedure }

ensure that {

    when { UE receives an IDENTITY REQUEST message (requested identification parameter is not SUCI), without integrity protected }

    then { UE does not transmit IDENTITY Response }

    }

9.1.2.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clause 4.4.4.1, 4.4.4.2, 5.4.2.1, 5.4.2.2 and 5.4.2.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.4.4.1]

For the UE, integrity protected signalling is mandatory for the 5GMM NAS messages once a valid 5G NAS security context exists and has been taken into use. For the network, integrity protected signalling is mandatory for the 5GMM NAS messages once a secure exchange of 5GS NAS messages has been established for the NAS signalling connection. Integrity protection of all NAS signalling messages is the responsibility of the NAS. It is the network which activates integrity protection.

[TS 24.501, clause 4.4.4.2]

Once the secure exchange of NAS messages has been established, the receiving 5GMM entity in the UE shall not process any NAS signalling messages unless they have been successfully integrity checked by the NAS. If NAS signalling messages, having not successfully passed the integrity check, are received, then the NAS in the UE shall discard that message. The processing of the SECURITY MODE COMMAND message that has not successfully passed

the integrity check is specified in subclause 5.4.2.5. If any NAS signalling message is received as not integrity protected even though the secure exchange of NAS messages has been established by the network, then the NAS shall discard this message.

[TS 24.501, clause 5.4.2.1]

The purpose of the NAS security mode control procedure is to take a 5G NAS security context into use, and initialise and start NAS signalling security between the UE and the AMF with the corresponding 5G NAS keys and 5G NAS security algorithms.

[TS 24.501, clause 5.4.2.2]

The AMF initiates the NAS security mode control procedure by sending a SECURITY MODE COMMAND message to the UE and starting timer T3560 (see example in figure 5.4.2.2).

The AMF shall reset the downlink NAS COUNT counter and use it to integrity protect the initial SECURITY MODE COMMAND message if the security mode control procedure is initiated:

- a) to take into use the security context created after a successful execution of the 5G AKA based primary authentication and key agreement procedure or the EAP based primary authentication and key agreement procedure; or

...

The AMF shall send the SECURITY MODE COMMAND message uncyphered, but shall integrity protect the message with the 5G NAS integrity key based on  $K_{AMF}$  or mapped  $K'_{AMF}$  indicated by the ngKSI included in the message. The AMF shall set the security header type of the message to "integrity protected with new 5G NAS security context".

...

The AMF shall include the replayed security capabilities of the UE (including the security capabilities with regard to NAS, RRC and UP (user plane) ciphering as well as NAS and RRC integrity, and other possible target network security capabilities, i.e. E-UTRAN if the UE included them in the message to network), the selected 5GS ciphering and integrity algorithms and the ngKSI.

[TS 24.501, clause 5.4.2.3]

Upon receipt of the SECURITY MODE COMMAND message, the UE shall check whether the security mode command can be accepted or not. This is done by performing the integrity check of the message, and by checking that the received Replayed UE security capabilities IE has not been altered compared to the latest values that the UE sent to the network.

...

If the type of security context flag included in the SECURITY MODE COMMAND message is set to "native security context" and if the ngKSI matches a valid non-current native 5G NAS security context held in the UE while the UE has a mapped 5G NAS security context as the current 5G NAS security context, the UE shall take the non-current native 5G NAS security context into use which then becomes the current native 5G NAS security context and delete the mapped 5G NAS security context.

...

If the SECURITY MODE COMMAND message can be accepted, the UE shall take the 5G NAS security context indicated in the message into use. The UE shall in addition reset the uplink NAS COUNT counter if:

- a) the SECURITY MODE COMMAND message is received in order to take a 5G NAS security context into use created after a successful execution of the 5G AKA based primary authentication and key agreement procedure or the EAP based primary authentication and key agreement procedure; or

b) the SECURITY MODE COMMAND message received includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE the ngKSI does not match the current 5G NAS security context, if it is a mapped 5G NAS security context.

...

If the SECURITY MODE COMMAND message can be accepted, the UE shall send a SECURITY MODE COMPLETE message integrity protected with the selected 5GS integrity algorithm and the 5G NAS integrity key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  if the type of security context flag is set to "mapped security context" indicated by the ngKSI. When the SECURITY MODE COMMAND message includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE, then the UE shall check whether the SECURITY MODE COMMAND message indicates the ngKSI of the current 5GS security context, if it is a mapped 5G NAS security context, in order not to re-generate the  $K'_{AMF}$ .

...

From this time onward the UE shall cipher and integrity protect all NAS signalling messages with the selected 5GS integrity and ciphering algorithms.

9.1.2.3.3

Test description

9.1.2.3.3.1

Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.2.3.3.2

Test procedure sequence

Table 9.1.2.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The UE is switched on.	-	-	-	-
2-6	Steps 2-6 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
7	The SS transmits a SECURITY MODE COMMAND message to activate NAS security. It is integrity protected.	<--	SECURITY MODE COMMAND	-	-
8	Check: Does the UE transmit a SECURITY MODE COMPLETE message and starts applying the NAS Integrity protection in both UL and DL?	-->	SECURITY MODE COMPLETE	1	P
9-18a1	Steps 10-19a1 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
19	The SS transmits an IDENTITY REQUEST message with Integrity protected and with default ciphering	<--	IDENTITY REQUEST	-	-
20	Check: Does the UE transmit an IDENTIY RESPONSE message with Integrity Protected and with default ciphering?	-->	IDENTITY RESPONSE	1	P
21	The SS transmits an IDENTITY REQUEST message (not Integrity protected)	<--	IDENTITY REQUEST	-	-
22	Check: Does the UE transmit an IDENTIY RESPONSE message within the next 5 seconds?	-->	IDENTITY RESPONSE	2	F

9.1.2.3.3.3 Specific message contents

Table 9.1.2.3.3.3-1: SECURITY MODE COMMAND (Step 7, Table 9.1.2.3.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of integrity protection algorithm	'0001'B	5G integrity algorithm 128-5G-IA1[SNOW3G]	

9.1.2.4 Integrity protection / Correct functionality of 5G NAS integrity algorithm / AES

9.1.2.4.1 Test Purpose (TP)

(1)

with { successful completion of 5G authentication and key agreement (AKA) procedure }

ensure that {

    when { UE receives a an integrity protected SECURITY MODE COMMAND message instructing to start integrity protection using algorithm AES }

    then { UE transmits an integrity protected SECURITY MODE COMPLETE using AES and starts applying the NAS Integrity protection in both UL and DL }

}



(2)

```
with { Integrity protection successful started by executing Security Mode Procedure }

ensure that {

    when { UE receives an IDENTITY REQUEST message (requested identification parameter is not SUCI),
without integrity protected }

        then { UE does not transmit IDENTITY Response }

}
```

9.1.2.4.2 Conformance requirements

Same Conformance requirements as in clause 9.1.2.3.2.

9.1.2.4.3 Test description

9.1.2.4.3.1 Pre-test conditions

Same Pre-test conditions as in clause 9.1.2.3.3.1.

9.1.2.4.3.2 Test procedure sequence

Same Test procedure sequence as in table 9.1.2.3.3.2-1, except the integrity protection algorithm is AES.

9.1.2.4.3.3 Specific message contents

Table 9.1.2.4.3.3-1: SECURITY MODE COMMAND (Step 7)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of integrity protection algorithm	'0010'B	5G integrity algorithm 128-5G-IA2 [AES]	

9.1.2.5 Integrity protection / Correct functionality of 5G NAS integrity algorithm / ZUC

9.1.2.5.1 Test Purpose (TP)

(1)

```
with { successful completion of 5G authentication and key agreement (AKA) procedure }

ensure that {

    when { UE receives a an integrity protected SECURITY MODE COMMAND message instructing to start
integrity protection using algorithm ZUC }

        then { UE transmits an integrity protected SECURITY MODE COMPLETE using ZUC and starts applying
the NAS Integrity protection in both UL and DL }

}
```

(2)

with { Integrity protection successful started by executing Security Mode Procedure }

ensure that {

    when { UE receives an IDENTITY REQUEST message (requested identification parameter is not SUCI),  
without integrity protected }

        then { UE does not transmit IDENTITY Response }

    }

9.1.2.5.2            Conformance requirements

Same Conformance requirements as in clause 9.1.2.3.2.

9.1.2.5.3            Test description

9.1.2.5.3.1          Pre-test conditions

Same Pre-test conditions as in clause 9.1.2.3.3.1.

9.1.2.5.3.2          Test procedure sequence

Same Test procedure sequence as in table 9.1.2.3.3.2-1, except the integrity protection algorithm is ZUC.

9.1.2.5.3.3          Specific message contents

Table 9.1.2.5.3.3-1: SECURITY MODE COMMAND (Step 7)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of integrity protection algorithm	'0011'B	5G integrity algorithm 128-5G-IA3 [ZUC]	

9.1.2.6            Cipherring and deciphering / Correct functionality of 5G NAS encryption algorithm / SNOW3G

9.1.2.6.1            Test Purpose (TP)

(1)

with { successful completion of 5G authentication and key agreement (AKA) procedure }

ensure that {

    when { UE receives a SECURITY MODE COMMAND instructing to start cipherring using algorithm SNOW3G }

        then { UE sends a SECURITY MODE COMPLETE message ciphpered with SNOW3G and starts applying the NAS cipherring in both UL and DL }

}

**9.1.2.6.2 Conformance requirements**

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clause 5.4.3.1, 5.4.3.2 and 5.4.3.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.2.1]

The purpose of the NAS security mode control procedure is to take a 5G NAS security context into use, and initialise and start NAS signalling security between the UE and the AMF with the corresponding 5G NAS keys and 5G NAS security algorithms.

[TS 24.501, clause 5.4.2.2]

The AMF initiates the NAS security mode control procedure by sending a SECURITY MODE COMMAND message to the UE and starting timer T3560 (see example in figure 5.4.2.2).

The AMF shall reset the downlink NAS COUNT counter and use it to integrity protect the initial SECURITY MODE COMMAND message if the security mode control procedure is initiated:

- a) to take into use the security context created after a successful execution of the 5G AKA based primary authentication and key agreement procedure or the EAP based primary authentication and key agreement procedure; or

...

The AMF shall send the SECURITY MODE COMMAND message uncyphered, but shall integrity protect the message with the 5G NAS integrity key based on  $K_{AMF}$  or mapped  $K'_{AMF}$  indicated by the ngKSI included in the message. The AMF shall set the security header type of the message to "integrity protected with new 5G NAS security context".

...

The AMF shall include the replayed security capabilities of the UE (including the security capabilities with regard to NAS, RRC and UP (user plane) ciphering as well as NAS and RRC integrity, and other possible target network security capabilities, i.e. E-UTRAN if the UE included them in the message to network), the selected 5GS ciphering and integrity algorithms and the ngKSI.

[TS 24.501, clause 5.4.2.3]

Upon receipt of the SECURITY MODE COMMAND message, the UE shall check whether the security mode command can be accepted or not. This is done by performing the integrity check of the message, and by checking that the received Replayed UE security capabilities IE has not been altered compared to the latest values that the UE sent to the network.

...

If the type of security context flag included in the SECURITY MODE COMMAND message is set to "native security context" and if the ngKSI matches a valid non-current native 5G NAS security context held in the UE while the UE has a mapped 5G NAS security context as the current 5G NAS security context, the UE shall take the non-current native 5G NAS security context into use which then becomes the current native 5G NAS security context and delete the mapped 5G NAS security context.

...

If the SECURITY MODE COMMAND message can be accepted, the UE shall take the 5G NAS security context indicated in the message into use. The UE shall in addition reset the uplink NAS COUNT counter if:

- a) the SECURITY MODE COMMAND message is received in order to take a 5G NAS security context into use created after a successful execution of the 5G AKA based primary authentication and key agreement procedure or the EAP based primary authentication and key agreement procedure; or
- b) the SECURITY MODE COMMAND message received includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE the ngKSI does not match the current 5G NAS security context, if it is a mapped 5G NAS security context.

...

If the SECURITY MODE COMMAND message can be accepted, the UE shall send a SECURITY MODE COMPLETE message integrity protected with the selected 5GS integrity algorithm and the 5G NAS integrity key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  if the type of security context flag is set to "mapped security context" indicated by the ngKSI. When the SECURITY MODE COMMAND message includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE, then the UE shall check whether the SECURITY MODE COMMAND message indicates the ngKSI of the current 5GS security context, if it is a mapped 5G NAS security context, in order not to re-generate the  $K'_{AMF}$ .

Furthermore, if the SECURITY MODE COMMAND message can be accepted, the UE shall cipher the SECURITY MODE COMPLETE message with the selected 5GS ciphering algorithm and the 5GS NAS ciphering key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  indicated by the ngKSI. The UE shall set the security header type of the message to "integrity protected and ciphered with new 5G NAS security context".

From this time onward the UE shall cipher and integrity protect all NAS signalling messages with the selected 5GS integrity and ciphering algorithms

9.1.2.6.3

Test description

9.1.2.6.3.1

Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.2.6.3.2

Test procedure sequence

Table 9.1.2.6.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The UE is switched on.	-	-	-	-
2-6	Steps 2-6 of the generic procedure for UE registration specified in TS 38.508-1 [4] subclause 4.5.2.3 are performed.	-	-	-	-
7	The SS transmits a SECURITY MODE COMMAND message to activate NAS security.	<--	SECURITY MODE COMMAND	-	-
8	Check: Does the UE transmit a SECURITY MODE COMPLETE message ciphered and starts applying the NAS ciphering in both UL and DL?	-->	SECURITY MODE COMPLETE	1	P
9-18a1	Steps 10-19a1 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
19	The SS transmits an IDENTITY REQUEST message Ciphered	<--	IDENTITY REQUEST	-	-
20	Check: Does the UE transmit an IDENTIY RESPONSE message Ciphered?	-->	IDENTITY RESPONSE	1	P

9.1.2.6.3.3 Specific message contents

Table 9.1.2.6.3.3-1: SECURITY MODE COMMAND (Step 7, Table 9.1.2.6.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of ciphering algorithm	'0001'B	5G encryption algorithm 128-5G-EA1 [SNOW3G]	

9.1.2.7 Ciphering and deciphering / Correct functionality of 5G NAS encryption algorithm / AES

9.1.2.7.1 Test Purpose (TP)

(1)

with { successful completion of 5G authentication and key agreement (AKA) procedure }

ensure that {

    when { UE receives a SECURITY MODE COMMAND instructing to start ciphering using algorithm AES }

        then { UE sends a SECURITY MODE COMPLETE message ciphered with AES and starts applying the NAS ciphering in both UL and DL }

    }

9.1.2.7.2 Conformance requirements

Same conformance requirement as in clause 9.1.2.6.2.

9.1.2.7.3

Test description

9.1.2.7.3.1

Pre-test conditions

Same Pre-test conditions as in clause 9.1.2.6.3.1.

9.1.2.7.3.2

Test procedure sequence

Same Test procedure sequence as in Table 9.1.2.6.3.2-1, except the ciphering algorithm is AES.

9.1.2.7.3.3

Specific message contents

Table 9.1.2.7.3.3-1: SECURITY MODE COMMAND (Step 7)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of ciphering algorithm	'0010'B	5G encryption algorithm 128-5G-EA2 [AES]	

9.1.2.8

Ciphering and deciphering / Correct functionality of 5G NAS encryption algorithm / ZUC

9.1.2.8.1

Test Purpose (TP)

(1)

```
with { successful completion of 5G authentication and key agreement (AKA) procedure }  
  
ensure that {  
  
    when { UE receives a SECURITY MODE COMMAND instructing to start ciphering using algorithm ZUC }  
  
        then { UE sends a SECURITY MODE COMPLETE message ciphered with ZUC and starts applying the NAS  
ciphering in both UL and DL }  
  
}
```

9.1.2.8.2

Conformance requirements

Same conformance requirement as in clause 9.1.2.6.2.

9.1.2.8.3

Test description

9.1.2.8.3.1

Pre-test conditions

Same Pre-test conditions as in clause 9.1.2.6.3.1.

9.1.2.8.3.2

Test procedure sequence

Same Test procedure sequence as in Table 9.1.2.6.3.2-1, except the ciphering algorithm is ZUC.

9.1.2.8.3.3

Specific message contents

Table 9.1.2.8.3.3-1: SECURITY MODE COMMAND (Step 7)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of ciphering algorithm	'0011'B	5G encryption algorithm 128-5G-EA3 [ZUC]	

9.1.3

Identification

9.1.3.1

Identification procedure

9.1.3.1.1

Test Purpose (TP)

(1)

with { The UE is in 5GMM-REGISTERED-INITIATED state and the SS sends an IDENTITY REQUEST message }

ensure that {

    when { UE detects transmission failure of IDENTITY RESPONSE message }

        then { The UE re-initiates the Initial registration procedure }

    }

(2)

with { The UE is in 5GMM-CONNECTED mode and the SS sends an IDENTITY REQUEST message }

ensure that {

    when { The UE receives the unprotected IDENTITY REQUEST message with identity type as SUCI }

        then { UE transmits the IDENTITY RESPONSE message with identity type set to SUCI }

    }

(3)

with { The UE is in 5GMM-CONNECTED mode and the SS sends an IDENTITY REQUEST message }

ensure that {

    when { the UE receives an IDENTITY REQUEST with identity type set as IMEISV }

        then { UE transmits an IDENTITY RESPONSE with identity type set as IMEISV }

    }

(4)

**with** { The UE is in 5GMM-CONNECTED mode and the SS sends an IDENTITY REQUEST message }  
**ensure that** {  
    **when** { the UE receives an IDENTITY REQUEST with identity type set as “IMEI” }  
        **then** { UE transmits an IDENTITY RESPONSE with identity type set as “IMEI” }  
    }  
}

(5)

**with** { The UE is in 5GMM-CONNECTED mode and the SS sends an IDENTITY REQUEST message }  
**ensure that** {  
    **when** { the UE receives an IDENTITY REQUEST with identity type set as “5G-GUTI” and has no valid 5G-GUTI available }  
        **then** { UE transmits an IDENTITY RESPONSE with identity type set as “No identity” }  
    }  
}

9.1.3.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.4.3.3, 4.4.4.3 and 5.4.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.3.3]

A UE shall be ready to respond to an IDENTITY REQUEST message at any time whilst in 5GMM-CONNECTED mode.

Upon receipt of the IDENTITY REQUEST message:

- a) if the Identity type IE in the IDENTITY REQUEST message is not set to "SUCI", the UE shall send an IDENTITY RESPONSE message to the network. The IDENTITY RESPONSE message shall contain the identification parameters as requested by the network; and
- b) if the Identity type IE in the IDENTITY REQUEST message is set to "SUCI", the UE shall:
  - 1) if timer T3519 is not running, generate a fresh SUCI as specified in 3GPP TS 33.501 [24], send an IDENTITY RESPONSE message with the SUCI, start timer T3519 and store the value of the SUCI sent in the IDENTITY RESPONSE message; and
  - 2) if timer T3519 is running, send an IDENTITY RESPONSE message with the stored SUCI.

[TS 24.501, clause 4.4.4.3]

Except the messages listed below, no NAS signalling messages shall be processed by the receiving 5GMM entity in the AMF or forwarded to the 5GSM entity, unless the secure exchange of NAS messages has been established for the NAS signalling connection:

- a) REGISTRATION REQUEST;
- b) IDENTITY RESPONSE (if requested identification parameter is SUCI);



- c) AUTHENTICATION RESPONSE;
- d) AUTHENTICATION FAILURE;
- e) SECURITY MODE REJECT;
- f) DEREGISTRATION REQUEST; and
- g) DEREGISTRATION ACCEPT;

NOTE 1: The REGISTRATION REQUEST message is sent by the UE without integrity protection, if the registration procedure is initiated due to an inter-system change in 5GMM-IDLE mode and no current 5G NAS security context is available in the UE. The other messages are accepted by the AMF without integrity protection, as in certain situations they are sent by the UE before security can be activated.

NOTE 2: The DEREGISTRATION REQUEST message can be sent by the UE without integrity protection, e.g. if the UE is registered for emergency services and there is no shared 5G NAS security context available, or if due to user interaction a registration procedure is cancelled before the secure exchange of NAS messages has been established. For these cases the network can attempt to use additional criteria (e.g. whether the UE is subsequently still performing periodic registration update or still responding to paging) before marking the UE as 5GMM-DEREGISTERED.

Integrity protection is never applied directly to 5GSM messages, but to the 5GMM message in which the 5GSM message is included.

Once a current 5G NAS security context exists, until the secure exchange of NAS messages has been established for the NAS signalling connection, the receiving 5GMM entity in the AMF shall process the following NAS signalling messages, even if the MAC included in the message fails the integrity check or cannot be verified, as the 5G NAS security context is not available in the network:

- a) REGISTRATION REQUEST;
- b) IDENTITY RESPONSE (if requested identification parameter is SUCI);
- c) AUTHENTICATION RESPONSE;
- d) AUTHENTICATION FAILURE;
- e) SECURITY MODE REJECT;
- f) DEREGISTRATION REQUEST;
- g) DEREGISTRATION ACCEPT; and
- h) SERVICE REQUEST;

...

[TS 24.501, clause 5.4.3.5]

The following abnormal cases can be identified:

- a) Transmission failure of the IDENTITY RESPONSE message (if the identification procedure is triggered by a registration procedure).

The UE shall re-initiate the registration procedure.

- b) Requested identity is not available

If the UE cannot encode the requested identity in the IDENTITY RESPONSE message, e.g. because no valid USIM is available, then it shall encode the identity type as "No identity".

9.1.3.1.3

Test description

9.1.3.1.3.1

Pre test conditions

System Simulator:

- NGC Cell A is configured as "Serving cell" according to TS 38.508-1 [4] Table 6.3.2.2-1.
- System information combination NR-1 as defined in TS 38.508-1 [4] clause 4.4.3.1.2 is used.

UE:

None.

Preamble:

- The UE is in state Switched OFF (State 0N-B) as per TS 38.508-1[4] Table 4.4A.2-0.

9.1.3.1.3.2

Test procedure sequence

Table 9.1.3.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

-	Void	-	-	-	-
1	The UE is switched on.	-	-	-	-
2-4	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
5	SS is configured to not allocate any UL grant and RA Response, so that the UE cannot send the IDENTITY RESPONSE to SS.	-	-	-	-
6	The SS transmits an IDENTITY REQUEST requesting SUCI in the IE identity type.	<--	IDENTITY REQUEST	-	-
6A	SS starts timer of T3511 (Note 1).	-	-	-	-
6B	SS locally releases the RRC connection.	-	-	-	-
6C	Wait for T3511 to time out.	-	-	-	-
6D	SS configures the RA Response.	-	-	-	-
7-9	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4]. (Note 2)	-	-	1	P
10	The SS transmits an unprotected IDENTITY REQUEST requesting SUCI in the IE identity type.	<--	IDENTITY REQUEST	-	-
11	Check: Does the UE respond with an IDENTITY RESPONSE message with IE identity type set to "SUCI"?	-->	IDENTITY RESPONSE	2	P
11 A	The SS transmits a REGISTRATION REJECT (Cause #3, illegal UE).	<--	REGISTRATION REJECT	-	-
11 B	The SS releases the RRC.	-	-	-	-
11 C	The UE is Switched OFF.	-	-	-	-
11 D	The UE is Switched ON.	-	-	-	-
12-24	Steps 1–13 of Table 4.5.2.2-2 in TS 38.508-1 [4] are performed.	-	-	-	-
25	The SS transmits an IDENTITY REQUEST requesting 5G-GUTI in the IE identity type.	<--	IDENTITY REQUEST	-	-
26	Check: Does the UE respond with an IDENTITY RESPONSE message with IE identity type set to "No identity"?	-->	IDENTITY RESPONSE	5	P
27-29 Ba 1	Steps 14-19a1 of Table 4.5.2.2-2 in TS 38.508-1 [4] are performed.	-	-	-	-
30	The SS transmits an IDENTITY REQUEST requesting IMEISV in the IE identity type.	<--	IDENTITY REQUEST	-	-
31	Check: Does the UE respond with an IDENTITY RESPONSE message with IE identity type set to IMEISV?	-->	IDENTITY RESPONSE	3	P
32	The SS transmits an IDENTITY REQUEST requesting IMEI in the IE identity type.	<--	IDENTITY REQUEST	-	-
33	Check: Does the UE respond with an IDENTITY RESPONSE message with IE identity type set to IMEI?	-->	IDENTITY RESPONSE	4	P
34-35	Void	-	-	-	-
Note 1: To send the IDENTITY RESPONSE, the UE will initiate RACH to get UL grant. Since there is no RA Response, registration failure due to lower layer failure will occur, then T3511 will start.					
Note 2: The UL grant is restarted in step 8.					

9.1.3.1.3.3

Specific message contents

Table 9.1.3.1.3.3-1: IDENTITY REQUEST (step 6, 10 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'001'B	SUCI	

Table 9.1.3.1.3.3-2: IDENTITY RESPONSE (step 11 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
Identity type	'001'B	SUCI	

Table 9.1.3.1.3.3-3: IDENTITY REQUEST (step 30 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'101'B	IMEISV	

Table 9.1.3.1.3.3-4: IDENTITY RESPONSE (step 31 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
Identity type	'101'B	IMEISV	

Table 9.1.3.1.3.3-5: IDENTITY REQUEST (step 32 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'011'B	IMEI	

Table 9.1.3.1.3.3-6: IDENTITY RESPONSE (step 33 Table 9.1.3.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
Identity type	'011'B	IMEI	

Table 9.1.3.1.3.3-7: IDENTITY REQUEST (step 25 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'010'B	5G-GUTI	

Table 9.1.3.1.3.3-8: IDENTITY RESPONSE (step 26 Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
Identity type	'000'B	No Identity	

Table 9.1.3.1.3.3-9: Void

Table 9.1.3.1.3.3-10: REGISTRATION REJECT (step 11A Table 9.1.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'00000011'B	Illegal UE	

9.1.4 Generic UE configuration update

9.1.4.1 Generic UE configuration update / New 5G-GUTI, NITZ, registration requested, Network slicing indication, New Allowed NSSAI / acknowledgement from the UE

9.1.4.1.1 Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED state }

ensure that {

    when { UE receives a new 5G-GUTI in the CONFIGURATION UPDATE COMMAND message and acknowledgement from the UE is requested }

    then { UE sends a CONFIGURATION UPDATE COMPLETE message and UE shall consider new 5G-GUTI as valid }

    }

(2)

with { UE in 5GMM-REGISTERED state }

ensure that {

    when { UE receives a NITZ information in the CONFIGURATION UPDATE COMMAND message and acknowledgement from the UE is not requested }

    then { UE updates NITZ information }

    }

(3)

with { UE in 5GMM-REGISTERED state }

ensure that {

    when { UE receives CONFIGURATION UPDATE COMMAND message indicating “registration requested” and contains no other parameters }

        then { UE deletes any stored allowed NSSAI for this PLMN and then release the existing N1 NAS signalling connection, starts a mobility registration procedure }

    }

(4)

with { UE in 5GMM-REGISTERED state }

ensure that {

    when { UE receives a new allowed NSSAI in the CONFIGURATION UPDATE COMMAND message and registration is not requested }

        then { UE replaces any stored allowed NSSAI for this PLMN with new allowed NSSAI }

    }

(5)

with { UE in 5GMM-REGISTERED state }

ensure that {

    when { UE receives a Network Slicing subscription change indication set to "Network slicing subscription changed" in the CONFIGURATION UPDATE COMMAND message and registration is not requested }

        then { UE deletes the network slicing information for each and every PLMN except for the current PLMN and default configured NSSAI }

    }

9.1.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 4.6.2.2, 5.4.4.1, 5.4.4.2, 5.4.4.3, 5.5.1.2.2 and 5.5.1.3.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 4.6.2.2]

If available, the configured NSSAI(s) shall be stored in a non-volatile memory in the ME as specified in annex C.

...

If the UE receives the CONFIGURATION UPDATE COMMAND message indicating "registration requested" and contains no other parameters (see subclauses 5.4.4.2 and 5.4.4.3), the UE shall delete any stored allowed NSSAI for this PLMN, and delete any stored mapping of each S-NSSAI of the allowed NSSAI to the S-NSSAI(s) of the HPLMN, if available;

...

- d) When the UE receives the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message or in the CONFIGURATION UPDATE COMMAND message, the UE shall delete the network slicing information for each of the PLMNs that the UE has slicing information stored for (excluding the current PLMN). The UE shall not delete the default configured NSSAI. Additionally, the UE shall update the network slicing information for the current PLMN (if received) as specified above in bullets a), b) and c):

[TS 24.501 clause 5.4.4.1]

The purpose of this procedure is to:

- a) allow the AMF to update the UE configuration for access and mobility management-related parameters decided and provided by the AMF by providing new parameter information within the command; or
- b) request the UE to perform a registration procedure for mobility and periodic registration update towards the network to update access and mobility management-related parameters decided and provided by the AMF (see subclause 5.5.1.3).

This procedure is initiated by the network and can only be used when the UE has an established 5GMM context, and the UE is in 5GMM-CONNECTED mode. When the UE is in 5GMM-IDLE mode, the AMF may use the paging or notification procedure to initiate the generic UE configuration update procedure. The AMF can request a confirmation response in order to ensure that the parameter has been updated by the UE.

This procedure shall be initiated by the network to assign a new 5G-GUTI to the UE after a successful service request procedure invoked as a response to a paging request from the network and before the release of the N1 NAS signalling connection. If the service request procedure was triggered due to 5GSM downlink signalling pending, the procedure for assigning a new 5G-GUTI can be initiated by the network after the transport of the 5GSM downlink signalling.

The following parameters are supported by the generic UE configuration update procedure without the need to request the UE to perform the registration procedure for mobility and periodic registration update:

- a) 5G-GUTI;
- b) TAI list;
- c) Service area list;
- d) Network identity and time zone information (Full name for network, short name for network, local time zone, universal time and local time zone, network daylight saving time);
- e) LADN information;
- f) Rejected NSSAI;
- g) Network slicing indication;
- h) Operator-defined access category definitions; and
- i) SMS indication.

The following parameters can be sent to the UE with or without a request to perform the registration procedure for mobility and periodic registration update:

- a) Allowed NSSAI; or
- b) Configured NSSAI.

The following parameter is sent to the UE with a request to perform the registration procedure for mobility and periodic registration update:

- a) MICO indication.

The following parameters are sent over 3GPP access only:

- a) LADN information;
- b) MICO indication;
- c) TAI list; and
- d) Service area list.

The following parameters are managed and sent per access type i.e., independently over 3GPP access or non 3GPP access:

- a) Allowed NSSAI; and
- b) Rejected NSSAI (when the NSSAI is rejected for the current registration area).

The following parameters are managed commonly and sent over 3GPP access or non 3GPP access:

- a) 5G-GUTI;
- b) Network identity and time zone information;
- c) Rejected NSSAI (when the NSSAI is rejected for the current PLMN);
- d) Configured NSSAI; and
- e) SMS indication.

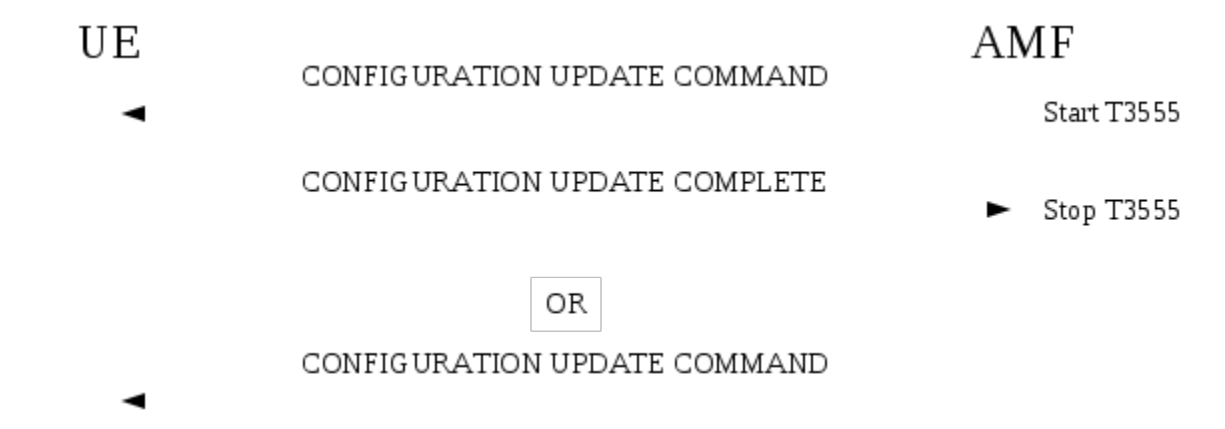


Figure 5.4.4.1.1: Generic UE configuration update procedure

[TS 24.501 clause 5.4.4.2]

The AMF shall initiate the generic UE configuration update procedure by sending the CONFIGURATION UPDATE COMMAND message to the UE.

The AMF shall in the CONFIGURATION UPDATE COMMAND message either:

- a) include one or more of the following parameters: 5G-GUTI, TAI list, allowed NSSAI that may include the mapped S-NSSAI(s), LADN information, service area list, MICO indication NITZ information, configured NSSAI that may include the mapped S-NSSAI(s), rejected NSSAI, network slicing indication, operator-defined access category definitions or SMS indication;



b) include the Configuration update indication IE with the Registration requested bit set to "registration requested";  
or

c) include a combination of both a) and b).

If an acknowledgement from the UE is requested, the AMF shall indicate "acknowledgement requested" in the Acknowledgement bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message and shall start timer T3555. Acknowledgement shall be requested for all parameters except when only NITZ is included.

To initiate parameter re-negotiation between the UE and network, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message.

If a new allowed NSSAI information or AMF re-configuration of supported S-NSSAIs requires an AMF relocation, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and include the Allowed NSSAI IE in the CONFIGURATION UPDATE COMMAND message.

If the AMF includes a new configured NSSAI in the CONFIGURATION UPDATE COMMAND message and the new configured NSSAI requires an AMF relocation as specified in 3GPP TS 23.501 [8], the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the message.

If the AMF indicates "registration requested" in the Registration requested bit of the Configuration update indication IE, acknowledgement shall be requested.

If changes to the allowed NSSAI require the UE to initiate a registration procedure, but the AMF is unable to determine an allowed NSSAI for the UE as specified in 3GPP TS 23.501 [8], the CONFIGURATION UPDATE COMMAND message shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE, and shall not contain any other parameters.

If the AMF needs to update the LADN information, the AMF shall include the LADN information in the LADN information IE of the CONFIGURATION UPDATE COMMAND message.

During an established 5GMM context, the network may send none, one, or more CONFIGURATION UPDATE COMMAND messages to the UE. If more than one CONFIGURATION UPDATE COMMAND message is sent, the messages need not have the same content.

[TS 24.501 clause 5.4.4.3]

Upon receiving the CONFIGURATION UPDATE COMMAND message, the UE shall stop timer T3346 if running and use the contents to update appropriate information stored within the UE.

If "acknowledgement requested" is indicated in the Acknowledgement bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message, the UE shall send a CONFIGURATION UPDATE COMPLETE message.

If the UE receives a new 5G-GUTI in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new 5G-GUTI as valid, the old 5G-GUTI as invalid, stop timer T3519 if running, and delete any stored SUCI; otherwise, the UE shall consider the old 5G-GUTI as valid. The UE shall provide the 5G-GUTI to the lower layer of 3GPP access if the CONFIGURATION UPDATE COMMAND message is sent over the non-3GPP access, and the UE is in 5GMM-REGISTERED in both 3GPP access and non-3GPP access in the same PLMN.

If the UE receives a new TAI list in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new TAI list as valid and the old TAI list as invalid; otherwise, the UE shall consider the old TAI list as valid.

If the UE receives a new service area list in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new service area list as valid and the old service area list as invalid; otherwise, the UE shall consider the old service area list, if any, as valid.

If the UE receives new NITZ information in the CONFIGURATION UPDATE COMMAND message, the UE considers the new NITZ information as valid and the old NITZ information as invalid; otherwise, the UE shall consider the old NITZ information as valid.

If the UE receives a LADN information IE in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the old LADN information as invalid and the new LADN information as valid, if any; otherwise, the UE shall consider the old LADN information as valid.

If the UE receives a new allowed NSSAI for the associated access type in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new allowed NSSAI as valid for the associated access type, store the allowed NSSAI for the associated access type as specified in subclause 4.6.2.2 and consider the old allowed NSSAI for the associated access type as invalid; otherwise, the UE shall consider the old Allowed NSSAI as valid for the associated access type.

If the UE receives a new configured NSSAI in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new configured NSSAI for the registered PLMN as valid and the old configured NSSAI for the registered PLMN as invalid; otherwise, the UE shall consider the old configured NSSAI for the registered PLMN as valid. The UE shall store the new configured NSSAI as specified in subclause 4.6.2.2.

If the UE receives the Network slicing indication IE in the CONFIGURATION UPDATE COMMAND message with the Network slicing subscription change indication set to "Network slicing subscription changed", the UE shall delete the network slicing information for each and every PLMN except for the current PLMN as specified in subclause 4.6.2.2.

If the UE receives Operator-defined access category definitions IE in the CONFIGURATION UPDATE COMMAND message and the Operator-defined access category definitions IE contains one or more operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the CONFIGURATION UPDATE COMMAND message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the CONFIGURATION UPDATE COMMAND message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE receives the SMS indication IE in the CONFIGURATION UPDATE COMMAND message with the SMS availability indication set to:

- a) "SMS over NAS not available", the UE shall consider that SMS over NAS transport is not allowed by the network; and
- b) "SMS over NAS available", the UE may request the use of SMS over NAS transport by performing a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3, after the completion of the generic UE configuration update procedure.

If the CONFIGURATION UPDATE COMMAND message indicates "registration requested" in the Registration requested bit of the Configuration update indication IE and:

- a) contains no other parameters or contains at least one of the following parameters: a new allowed NSSAI, a new configured NSSAI or the Network slicing subscription change indication, and:
  - 1) an emergency PDU session exists, the UE shall, after the completion of the generic UE configuration update procedure and the release of the emergency PDU session, release the existing N1 NAS signalling connection, and start a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3; or

- 2) no emergency PDU Session exists, the UE shall, after the completion of the generic UE configuration update procedure and the release of the existing N1 NAS signalling connection, start a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3; or
- b) an MICO indication is included without a new allowed NSSAI or a new configured NSSAI, the UE shall, after the completion of the generic UE configuration update procedure, start a registration procedure for mobility and registration update as specified in subclause 5.5.1.3 to re-negotiate MICO mode with the network.

The UE receiving the rejected NSSAI in the CONFIGURATION UPDATE COMMAND message takes the following actions based on the rejection cause in the rejected NSSAI:

"S-NSSAI not available in the current PLMN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current PLMN until switching off the UE or the UICC containing the USIM is removed.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current registration area as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current registration area until switching off the UE, the UE moving out of the current registration area or the UICC containing the USIM is removed.

[TS 24.501 clause 5.5.1.2.2]

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for the current PLMN.

NOTE 3: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation specific. The UE can take preferences indicated by the upper layers (e.g. policies, applications) into account.

NOTE 4: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

If the UE initiates an initial registration for emergency services or needs to prolong the established NAS signalling connection after the completion of the initial registration procedure (e.g. due to uplink signalling pending), the UE shall set the Follow-on request indicator to 1.

[TS 24.501 clause 5.5.1.3.2]

For a REGISTRATION REQUEST message with a 5GS registration type IE indicating "mobility registration updating", UE shall include the requested NSSAI containing the S-NSSAI(s) corresponding to the slices to which the UE intends to register with and shall include the mapped S-NSSAI(s) for the requested NSSAI, if available, in the REGISTRATION REQUEST message. If the UE has allowed NSSAI or configured NSSAI for the current PLMN, the requested NSSAI shall be either:

- a) the configured NSSAI for the current PLMN, or a subset thereof as described below, if the UE has no allowed NSSAI for the current PLMN;
- b) the allowed NSSAI for the current PLMN, or a subset thereof as described below, if the UE has an allowed NSSAI for the current PLMN; or
- c) the allowed NSSAI for the current PLMN, or a subset thereof as described below, plus one or more S-NSSAIs from the configured NSSAI for which no corresponding S-NSSAI is present in the allowed NSSAI and those are neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current registration area.

If the UE has neither allowed NSSAI for the current PLMN nor configured NSSAI for the current PLMN and has a default configured NSSAI, the UE shall:

- a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and
- b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has no allowed NSSAI for the current PLMN, no configured NSSAI for the current PLMN, and no default configured NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION REQUEST message.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to this PLMN, if the S-NSSAI is neither in the rejected NSSAIs for the current PLMN nor in the rejected NSSAI for the current registration area.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for this PLMN.

- NOTE 3: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation specific. The UE can take preferences indicated by the upper layers (e.g. policies, applications) into account.
- NOTE 4: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

9.1.4.1.3

Test description

9.1.4.1.3.1

Pre-test conditions

System Simulator:

- NGC Cell A configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in 38.508-1 [4] belongs to Home PLMN and set as serving cell;
- NGC Cell G configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in 38.508-1 [4] and set as Non-Suitable “Off” cell.
- System information combination NR-4 as defined in TS 38.508[4] clause 4.4.3.1.2 is used.

UE:

- UE is configured with NSSAI associated with HPLMN and with 5G-GUTI assigned.
- The UE is equipped with a USIM configuration as defined in TS 38.508-1 [4] Table 6.4.1-22.

Preamble:

- The UE is in state 3N-A on NGC cell A according to TS 38.508-1 [4].

9.1.4.1.3.2

Test procedure sequence

Table 9.1.4.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The SS transmits a CONFIGURATION UPDATE COMMAND message including a new 5G-GUTI.	<--	CONFIGURATION UPDATE COMMAND	-	-
2	Check: Does UE transmit a CONFIGURATION UPDATE COMPLETE message?	-->	CONFIGURATION UPDATE COMPLETE	1	P
3	The SS transmits an <i>RRCRelease</i> message.	-	-	-	-
4	The SS transmits a <i>Paging</i> message with the new 5G-GUTI.	-	-	-	-
5-11	Steps 2 to 8 of the generic procedure for NR_RRC_CONNECTED specified in TS 38.508-1 [4] subclause 4.5.4.2-3 are performed.	-	-	1	P
12	The SS transmits a CONFIGURATION UPDATE COMMAND message including NITZ information.	<--	CONFIGURATION UPDATE COMMAND	-	-
13	Check: Does the UE transmit a CONFIGURATION UPDATE COMPLETE message within the expiry of T3555?	-->	CONFIGURATION UPDATE COMPLETE	2	F
14	Check: Using MMI/AT command verify the NITZ update on the UE.	-	-	2	P
15	Switch off procedure in RRC_Connected specified in TS 38.508-1 [4] subclause 4.9.6.3 is performed.	-	-	-	-
16	The UE is switched On.	-	-	-	-
17-30	Steps 1 to 13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 [4] subclause 4.5.2 are performed.	-	-	-	-
31	The SS transmits a REGISTRATION ACCEPT message including Configured NSSAI.	<--	REGISTRATION ACCEPT	-	-
31A – 31E	Steps 15 to 19a1 of the generic procedure for NR RRC_IDLE as specified in TS 38.508-1 [4] subclause 4.5.2.2-2 with ' <i>connected without release</i> ' are performed.	-	-	-	-
32	The SS transmits a CONFIGURATION UPDATE COMMAND message including registration requested IE.	<--	CONFIGURATION UPDATE COMMAND	-	-
32A	The UE transmits a CONFIGURATION UPDATE COMPLETE message.	-->	CONFIGURATION UPDATE COMPLETE	-	-
32B	SS releases the RRC connection.	-	-	-	-
33	Check: Does UE transmit a REGISTRATION REQUEST message with registration type value set to "Mobility" and including the Requested NSSAI?	-->	REGISTRATION REQUEST	3	P
34-42	Void.	-	-	-	-
43	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
44	The UE transmits an <i>ULInformationTransfer</i> message and a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
44A	The SS transmits an <i>RRCRelease</i> message.	-	-	-	-
45	Check: Using MMI/AT command (+C5GNSSAIRDP) verify the update of allowed NSSAI.	-	-	3	P
45A – 45H	Steps 1 to 8 of the generic procedure for NR RRC_CONNECTED specified in TS 38.508-1 [4] subclause 4.5.4.2-3 are performed.	-	-	-	-
46	The SS transmits a CONFIGURATION UPDATE COMMAND message including a new allowed NSSAI list.	<--	CONFIGURATION UPDATE COMMAND	-	-
47	The UE transmits a CONFIGURATION	-->	CONFIGURATION UPDATE	-	-

	UPDATE COMPLETE message.		COMPLETE		
48	Check: Using MMI/AT command (+C5GNSSAIRDP) verify the update of allowed NSSAI.	-	-	4	P
48A	SS releases the RRC connection.	-	-	-	-
49	The SS configures NGC Cell A as the "Non-suitable cell" and NGC Cell G as the "Serving cell".	-	-	-	-
50-52	Steps 2-4 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
-	EXCEPTION: Steps 53A1 to 53A9 are performed if 5GS registration type is set as Initial Registration in step 52	-	-	-	-
53A1-53A9	Steps 5 to 13 of the generic test procedure in TS 38.508-1 Table 4.5.2.2-2 are performed on NGC Cell G.				
53a1-63	Void.	-	-	-	-
64	The SS transmits a REGISTRATION ACCEPT message including Allowed and Configured NSSAIs.	<--	REGISTRATION ACCEPT	-	-
-	EXCEPTION: Steps 65a1 to 65b describe behaviour that depends on events happening prior to their execution; the "lower case letter" identifies a step sequence that take place if a specific prior event takes place.	-	-	-	-
65a1-65a5a1	.IF 5GS registration type is set as Initial Registration in step 52, THEN Steps 15 to 19a1 of the generic test procedure in TS 38.508-1 Table 4.5.2.2-2 are performed on NGC Cell G.	-	-	-	-
65b	IF 5GS registration type is set as Mobility Registration in step 52, THEN UE transmits an ULInformationTransfer message and a REGISTRATION COMPLETE message on NGC Cell G.	-->	REGISTRATION COMPLETE	-	-
65	The UE transmits an <i>ULInformationTransfer</i> message and a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
66	The SS transmits a CONFIGURATION UPDATE COMMAND message with Network slicing subscription changed.	<--	CONFIGURATION UPDATE COMMAND	-	-
67	The UE transmits a CONFIGURATION UPDATE COMPLETE message.	-->	CONFIGURATION UPDATE COMPLETE	-	-
67A	Void	-	-	-	-
68	Check: Using MMI/AT command (+C5GNSSAIRDP) verify the update of allowed NSSAI.	-	-	5	P
69	The SS transmits NSSAI DELETE REQUEST message to delete the Default Configured NSSAI list.	<--	NSSAI DELETE REQUEST	-	-
70	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
71	The SS transmits an RRCRelease message.	<--	-	-	-

Table 9.1.4.1.3.3-10: NSSAI DELETE REQUEST (step 69, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	'10100110'B		
Delete NSSAI type	'00000001'B	Delete Configured NSSAI	
Configured NSSAI	00000000		

Table 9.1.4.1.3.3-11: NSSAI DELETE RESPONSE (step 70, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	'10100111'B		

9.1.4.1.3.3 Specific message contents

Table 9.1.4.1.3.3-1: CONFIGURATION UPDATE COMMAND (step 1, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	0001	Acknowledgement (ACK) requested	
5G-GUTI	Other than the default value		

Table 9.1.4.1.3.3-2: CONFIGURATION UPDATE COMMAND (step 12, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Full name for network	"C63A9BED0CB7CB31D98C56B3DD70" O	"FullName12345678", Note 1	
Short name for network	"5367B85D8EC966" O	"SName123", Note 1	
Local time zone	"40" O	"GMT+1", Note 1, Note 2	
Universal time and local time zone	"01402131832540" O	"2010 12 April 13:38 52s GMT+1", Note 1, Note 2	
Network daylight saving time	"01" O	"+1 hour adjustment for Daylight Saving Time", Note 1	
Note 1: Hard coded values have been chosen to allow for consistent/comparable SS behaviour.			
Note 2: Daylight Saving Time is included in the Local Time Zone.			

Table 9.1.4.1.3.3-3: REGISTRATION ACCEPT (step 31, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	‘001’B	3GPP access	
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	‘00000010’B	SST	
SST	‘00000001’B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3	
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000011’B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.4.1.3.3-4: CONFIGURATION UPDATE COMMAND (step 32, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	001	Registration and Acknowledgement (ACK) requested	

Table 9.1.4.1.3.3-5: REGISTRATION REQUEST (step 33, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	‘010’B		MOBILITY
Requested NSSAI			
S-NSSAI IEI		S-NSSAI value 2 (Note 1)	
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000010’B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3 (Note 1)	
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000011’B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note 1: the Requested NSSAI IE may include either S-NSSAI value 2, or S-NSSAI value 3, or S-NSSAI value 2 and S-NSSAI value 3.			

Table 9.1.4.1.3.3-6: REGISTRATION ACCEPT (step 43, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition



5GS registration result value	'001'B	3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000011'B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.4.1.3.3-7: CONFIGURATION UPDATE COMMAND (step 46, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	0001	Acknowledgement (ACK) requested	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.4.1.3.3-8: REGISTRATION ACCEPT (step 64, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'001'B	3GPP access	
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000011'B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.4.1.3.3-9: CONFIGURATION UPDATE COMMAND (step 66, Table 9.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	0001	Acknowledgement (ACK) requested	
Network slicing indication	0001	Network slicing subscription changed	

9.1.5Registration

9.1.5.1Initial Registration

9.1.5.1.1Initial registration / Success / 5G-GUTI reallocation, Last visited TAI

9.1.5.1.1.1Test Purpose (TP)

(1)

with { the UE is 5GMM-REGISTERED state with no valid 5G-GUTI but available SUCI }

ensure that {

    when { the UE is switched off and switched on }

        then { the UE sends a REGISTRATION REQUEST message including the SUCI in the 5GS mobile identity IE }

    }

(2)

with { the UE is 5GMM-REGISTERED state with a cell belong to a non-equivalent PLMN with assigned 5G-GUTI and last visited registered TAI }

ensure that {

    when { the UE is switched off and switched on with a cell belong to another PLMN }

        then { the UE sends a REGISTRATION REQUEST message including the 5G-GUTI assigned by the last PLMN in the 5GS mobile identity IE and the last visited registered TAI }

    }

(3)

with { the UE is 5GMM-REGISTERED state with a cell belong to an equivalent PLMN with assigned 5G-GUTI }

ensure that {

    when { the UE is switched off and switched on with a cell belong to another PLMN }

        then { the UE sends a REGISTRATION REQUEST message including the 5G-GUTI assigned by the equivalent PLMN in the 5GS mobile identity IE }

    }

(4)

```
with { the UE is 5GMM-REGISTERED state with an assigned 5G-GUTI }

ensure that {

    when { the UE is switched off and switched on with a cell belong to the same PLMN }

        then { the UE sends a REGISTRATION REQUEST message including the 5G-GUTI assigned by the last
registered PLMN in the 5GS mobile identity IE }

}
```

9.1.5.1.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.5.1.2.2 and 5.5.1.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.2]

The UE initiates the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF, starting timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

During initial registration the UE handles the 5GS mobile identity IE in the following order:

- b) if the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by the same PLMN with which the UE is performing the registration, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;
- c) if the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by an equivalent PLMN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;
- d) if the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP, by any other PLMN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;
- e) if a SUCI is available the UE shall include the SUCI in the 5GS mobile identity IE; and

...

If the SUCI is included in the 5GS mobile identity IE and the timer T3519 is not running, the UE shall start timer T3519 and store the value of the SUCI sent in the REGISTRATION REQUEST message. The UE shall include the stored SUCI in the REGISTRATION REQUEST message while timer T3519 is running.

...

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

9.1.5.1.1.3 Test description

9.1.5.1.1.3.1 Pre-test conditions

System Simulator:

- NGC Cell A, NGC Cell C and NGC Cell H are configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in 38.508-1 [4].

UE:

- None.

Preamble:

- The UE is in test state 0N-B according to TS 38.508-1 [4].

9.1.5.1.1.3.2            Test procedure sequence

Table 9.1.5.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		

1	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell H and NGC Cell C as the "Non-Suitable "off" cell".	-	-	-	-
2	The UE is switched on.	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
3-5	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
6	SS transmits an REGISTRATION REJECT message with the 5GMM cause IE setting as "Illegal UE". NOTE1: 5G-GUTI-1 should be deleted, then UE has no valid 5G-GUTI but available SUCI now.	<--	REGISTRATION REJECT	-	-
7	The generic test procedure in TS 38.508-1 Table 4.9.6.4-1 of Switch off procedure in State DEREGISTERED are performed.				
8	The UE is brought back to operation or the USIM is inserted.				
9-11	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
12	Check: Does the UE transmit an REGISTRATION REQUEST message including the SUCI in the 5GS mobile identity IE?	-->	REGISTRATION REQUEST	1	P
13-21	Steps 5-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
22	SS transmits an REGISTRATION ACCEPT message with a new assigned 5G-GUTI-2.	<--	REGISTRATION ACCEPT	-	-
23-27a1	Steps 15-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
28	The generic test procedure in TS 38.508-1 Table 4.9.6.3-1 of Switch off procedure in RRC_CONNECTED are performed.	-	-	-	-
29	The SS configures: - NGC Cell H as the "Serving cell". - NGC Cell A and NGC Cell C as a "Non-Suitable "off" cell".	-	-	-	-
30	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
-	The following messages are to be observed on NGC Cell H unless explicitly stated otherwise.	-	-	-	-
31-33	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
34	Check: Does the UE transmit an REGISTRATION REQUEST message including the 5G-GUTI-2 assigned by the last PLMN in the 5GS mobile identity IE and the last visited registered TAI?	-->	REGISTRATION REQUEST	2	P
35-43	Steps 5-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
44	SS transmits an REGISTRATION ACCEPT message with a new assigned 5G-GUTI-3 and the PLMN of NGC Cell A as Equivalent PLMNs.	<--	REGISTRATION ACCEPT	-	-
45-	Steps 15-19a1 of Table 4.5.2.2-2 of the	-	-	-	-

49a 1	generic procedure in TS 38.508-1 [4] are performed.				
50	The generic test procedure in TS 38.508-1 Table 4.9.6.3-1 of Switch off procedure in RRC_CONNECTED is performed.	-	-	-	-
51	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell H and NGC Cell C as a "Non-Suitable "off" cell".	-	-	-	-
52	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
53- 55	The UE establishes an RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
56	Check: Does the UE transmit an REGISTRATION REQUEST message including the 5G-GUTI-3 assigned by the equivalent PLMN in the 5GS mobile identity IE?	-->	REGISTRATION REQUEST	3	P
57- 65	Steps 5-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
66	SS transmits an REGISTRATION ACCEPT message with a new assigned 5G-GUTI-4.	<--	REGISTRATION ACCEPT	-	-
67- 71a 1	Steps 15-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
72	The generic test procedure in TS 38.508-1 Table 4.9.6.3-1 of Switch off procedure in RRC_CONNECTED is performed.	-	-	-	-
73	The SS configures: - NGC Cell C as the "Serving cell". - NGC Cell A and NGC Cell H as a "Non-Suitable off cell".	-	-	-	-
74	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
-	The following messages are to be observed on NGC Cell C unless explicitly stated otherwise.	-	-	-	-
75- 77	The UE establishes an RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-	-	-	-
78	Check: Does the UE transmit an REGISTRATION REQUEST message including the 5G-GUTI-4 assigned by last registered PLMN in the 5GS mobile identity IE?	-->	REGISTRATION REQUEST	4	P
79- 94	Steps 5-20 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-

9.1.5.1.1.3.3 Specific message contents

Table 9.1.5.1.1.3.3-1: Message REGISTRATION REJECT (step 6, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-9			
Information Element	Value/Remark	Comment	Condition
5GMM cause	'0000 0011'B	Illegal UE	

Table 9.1.5.1.1.3.3-2: Message REGISTRATION REQUEST (step 12, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'0000 0001'B	Initial registration	
5GS mobile identity	SUCI	The SUCI of UE	

Table 9.1.5.1.1.3.3-3: Message REGISTRATION ACCEPT (step 22, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-7			
Information Element	Value/Remark	Comment	Condition
5G-GUTI	5G-GUTI-2		

Table 9.1.5.1.1.3.3-4: Message REGISTRATION REQUEST (step 34, Table9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'0000 0001'B	Initial registration	
5GS mobile identity	5G-GUTI-2		
Last visited registered TAI	TAI-1	TAI of NGC Cell A	

Table 9.1.5.1.1.3.3-5: Message REGISTRATION ACCEPT (step 44, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-7			
Information Element	Value/Remark	Comment	Condition
5G-GUTI	5G-GUTI-3		
Equivalent PLMNs	The PLMN ID of NGC Cell A		

Table 9.1.5.1.1.3.3-6: Message REGISTRATION REQUEST (step 56, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'0000 0001'B	Initial registration	
5GS mobile identity	5G-GUTI-3		
Last visited registered TAI	TAI-8	TAI of NGC Cell H	

Table 9.1.5.1.1.3.3-7: Message REGISTRATION ACCEPT (step 66, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-7			
Information Element	Value/Remark	Comment	Condition
5G-GUTI	5G-GUTI-4		

Table 9.1.5.1.1.3.3-8: Message REGISTRATION REQUEST (step 78, Table 9.1.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition

5GS registration type	'0000 0001'B	Initial registration	
5GS mobile identity	5G-GUTI-4		
Last visited registered TAI	TAI-1	TAI of NGC Cell A	

9.1.5.1.2 Initial registration / 5GS services / Equivalent PLMN list handling

9.1.5.1.2.1 Test Purpose (TP)

(1)

with { The UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { UE receives a REGISTRATION ACCEPT with a new set of Equivalent PLMNs, then after Switch OFF and Switch ON }

        then { The UE deletes the old equivalent PLMN list and uses the new equivalent PLMN list }

    }

(2)

with { The UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { UE receives a REGISTRATION ACCEPT that does not include Equivalent PLMNs, then after Switch OFF and Switch ON }

        then { UE deletes the old equivalent PLMN list }

    }

(3)

with { The UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the UE receives a REGISTRATION ACCEPT that includes equivalent PLMN list, and the UE detects that an entry in the equivalent PLMN list is also present in forbidden PLMN list }

        then { UE deletes the entry in equivalent PLMN list that is also present in forbidden PLMN list }

    }

9.1.5.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.2.4 and 5.5.1.3.4. Unless otherwise stated these are Rel-15 requirements.



[TS 24.501, clause 5.5.1.2.4]

...

The AMF may also include a list of equivalent PLMNs in the REGISTRATION ACCEPT message. Each entry in the list contains a PLMN code (MCC+MNC). The UE shall store the list as provided by the network, and if the initial registration procedure is not for emergency services, the UE shall remove from the list any PLMN code that is already in the list of "forbidden PLMNs". In addition, the UE shall add to the stored list the PLMN code of the registered PLMN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list.

...

[TS 24.501, clause 5.5.1.3.4]

...

The AMF may also include a list of equivalent PLMNs in the REGISTRATION ACCEPT message. Each entry in the list contains a PLMN code (MCC+MNC). The UE shall store the list as provided by the network, and if there is no emergency PDU session established, the UE shall remove from the list any PLMN code that is already in the list of "forbidden PLMNs". If the UE is not registered for emergency services and there is an emergency PDU session established, the UE shall remove from the list of equivalent PLMNs any PLMN code present in the "forbidden PLMNs list" when the emergency PDU session is released. In addition, the UE shall add to the stored list the PLMN code of the registered PLMN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list.

...

9.1.5.1.2.3

Test description

9.1.5.1.2.3.1

Pre-test conditions

System Simulator:

- NGC Cell A and NGC Cell E and NGC Cell F are configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in TS 38.508-1 [4].
- NGC Cell F is configured with NR frequency NRf3.
- System information combination NR-4 as defined in TS 38.508 [4] clause 4.4.3.1.2 is used.

UE:

None.

Preamble:

- The UE is in state Switched OFF (State 0-A) as per TS 38.508-1 [4] Table 4.4A.2-0.

9.1.5.1.2.3.2

Test procedure sequence

Table 9.1.5.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence	TP	Verdict
----	-----------	------------------	----	---------

		U - S	Message		
1	The SS configures: - NGC Cell F as the "Serving cell". - NGC Cell E as the "Non-Suitable "off" cell". - NGC Cell A as the "Non-Suitable "off" cell".	-	-	-	-
2	The UE is Switched ON		-		
-	The following messages are to be observed on NGC Cell F unless explicitly stated otherwise		-		
3-14	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
15	SS transmits a REGISTRATION ACCEPT message with PLMN ID of NGC Cell A included in the Equivalent PLMNs IE	<--	REGISTRATION ACCEPT	-	-
16-20a1	Steps 15-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
21	The UE is switched off by executing generic procedure in Table 4.9.6.3-1 in TS 38.508-1 [4]	-	-	-	-
22	The UE is Switched ON	-	-	-	-
23-34	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
35	SS transmits a REGISTRATION ACCEPT message with PLMN ID of NGC Cell E included in the Equivalent PLMNs IE	<--	REGISTRATION ACCEPT	-	-
36-40a1	Steps 15-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
41	The UE is switched off by executing generic procedure in Table 4.9.6.3-1 in TS 38.508-1 [4].	-	-	-	-
42	The SS configures: - NGC Cell F as the "Non-Suitable "off" cell". - NGC Cell E as the "Suitable neighbour cell". - NGC Cell A as the "Serving cell".	-	-	-	-
43	The UE is Switched ON.	-	-	-	-
-	The following messages are to be observed on NGC Cell E unless explicitly stated otherwise	-	-	-	-
44-62a1	Steps 2-20a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	1	P
63	The UE is switched off by executing generic procedure in Table 4.9.6.1-1 in TS 38.508-1 [4].	-	-	-	-
63A	The SS configures: - NGC Cell F as the "Serving cell". - NGC Cell E as the "Non-Suitable "off" cell". - NGC Cell A as the "Suitable neighbour cell".	-	-	-	-
64	The UE is Switched ON	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise	-	-	-	-
64A	Steps 2-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	2	P
64B	The UE is switched off by executing generic procedure in Table 4.9.6.3-1 in TS 38.508-1 [4].	-	-	-	-
64C	The SS configures: - NGC Cell A as the "Non-Suitable "off" cell".	-	-	-	-
64D	The UE is Switched ON.	-	-	-	-
65-76	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	2	P

76 A	Void.	-	-	-	-
77	SS transmits a REGISTRATION REJECT with cause #11 (PLMN not allowed)	<--	REGISTRATION REJECT	-	-
78	The SS releases the RRC connection	-	-		
79	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell E as the "Non-Suitable "off" cell ". - NGC Cell F as the "Non-Suitable "off" cell ".	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise	-	-	-	-
80- 93	Steps 2-13 of Table 4.5.5.2.2- 2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
94	SS transmits a REGISTRATION ACCEPT message with PLMN ID of NGC Cell E and NGC Cell F included in the Equivalent PLMNs IE	<--	REGISTRATION ACCEPT	-	-
95- 99a 1	Steps 15-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
100	The UE is switched off by executing generic procedure in Table 4.9.6.3-1 in TS 38.508-1 [4].	-	-	-	-
101	The SS configures: - NGC Cell A as the "Non-Suitable "off" cell ". - NGC Cell E as the "Suitable neighbour cell". - NGC Cell F as the "Serving cell".	-	-	-	-
-	The following messages are to be observed on NGC Cell E unless explicitly stated otherwise	-	-	-	-
102	The UE is Switched ON	-	-	-	-
103 - 121 a1	Steps 2-20a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	3	P
122	The UE is switched off by executing generic procedure in Table 4.9.6.1-1 in TS 38.508-1 [4].	-	-	-	-
123	The SS configures: - NGC Cell A as the "Non-Suitable "off" cell ". - NGC Cell E as the "Non-Suitable "off" cell ". - NGC Cell F as the "Serving cell".	-	-	-	-
124	The UE is Switched ON	-	-	-	-
-	The user is prompted to manually select PLMN of NGC Cell F	-	-	-	-
-	The following messages are to be observed on NGC Cell F unless explicitly stated otherwise	-	-	-	-
125 - 143 a1	Steps 2-20a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
144	The user sets the UE in Automatic PLMN selection mode.	-	-	-	-

9.1.5.1.2.3.3                      Specific message contents

Table 9.1.5.1.2.3.3-1: REGISTRATION ACCEPT (step 15 Table 9.1.5.1.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

Equivalent PLMNs	MCC=003, MNC=101	PLMN ID of NGC Cell A	
------------------	------------------	-----------------------	--

Table 9.1.5.1.2.3.3-2: REGISTRATION ACCEPT (step 35 Table 9.1.5.1.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
Equivalent PLMNs	MCC=002, MNC=101	PLMN ID of NGC Cell E	

Table 9.1.5.1.2.3.3-3: REGISTRATION ACCEPT (step 94 Table 9.1.5.1.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
Equivalent PLMNs	MCC=003, MNC=101 and MCC=002, MNC=101	PLMN ID of NGC Cell F and PLMN ID of NGC Cell E	

Table 9.1.5.1.2.3.3-4: REGISTRATION REJECT (step 77 Table 9.1.5.1.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM Cause	‘0000 1011’B	PLMN not allowed	

### 9.1.5.1.3 Initial registration / 5GS services / NSSAI handling

#### 9.1.5.1.3.1 Test Purpose (TP)

(1)

```
with { UE has sent a REGISTRATION REQUEST message including Requested NSSAI}

ensure that {

    when { UE receives REGISTRATION ACCEPT message with Allowed NSSAI }

        then { UE shall replace any stored allowed NSSAI for the current PLMN with new allowed NSSAI for the current PLMN }

}
```

(2)

```
with { UE has sent a REGISTRATION REQUEST message including Requested NSSAI}

ensure that {

    when { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause “S-NSSAI not available in the current PLMN” }
```

```

    then { UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and not
attempt to use the Rejected NSSAI in the current PLMN until switching off the UE or the UICC
containing the USIM is removed }

}
```

**(3)**

```

with { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause "S-NSSAI not
available in the current PLMN" }

ensure that {

    when { UE has been switched off, then switched on }

        then { UE shall delete the stored Rejected NSAAI and shall send the NSSAI in Requested NSSAI IE
of the REGISTRATION REQUEST message as per the configured and Allowed NSSAI for current PLMN }

}
```

**(4)**

```

with { UE has sent a REGISTRATION REQUEST message including Requested NSSAI}

ensure that {

    when { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause "S-NSSAI not
available in the current registration area" }

        then { UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and
registration area combination and not attempt to use the Rejected NSSAI in the current registration
area until switching off the UE, the UE moving out of the current registration area or the UICC
containing the USIM is removed }

}
```

**(5)**

```

with { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause "S-NSSAI not
available in the current registration area" }

ensure that {

    when { UE has been moved out of the current registration area }

        then { UE shall delete the stored Rejected NSAAI for the current PLMN as well as registration
area combination and shall send the NSSAI in Requested NSSAI IE of the REGISTRATION REQUEST message
as per the configured and Allowed NSSAI for current PLMN }

}
```

**9.1.5.1.3.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], clause 5.5.1.2.2 and 5.5.1.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 5.5.1.2.2]

The UE shall include the requested NSSAI containing the S-NSSAI(s) corresponding to the slice(s) to which the UE wants to register and shall include the mapping of the requested NSSAI which is the mapping of each S-NSSAI of the requested NSSAI to the S-NSSAI(s) of the HPLMN, if available, in the REGISTRATION REQUEST message. If the UE has allowed NSSAI or configured NSSAI for the current PLMN, the requested NSSAI shall be either:

- a) the configured NSSAI for the current PLMN, or a subset thereof as described below, if the UE has no allowed NSSAI for the current PLMN;
- b) the allowed NSSAI for the current PLMN, or a subset thereof as described below, if the UE has an allowed NSSAI for the current PLMN; or
- c) the allowed NSSAI for the current PLMN, or a subset thereof as described below, plus one or more S-NSSAIs from the configured NSSAI for which no corresponding S-NSSAI is present in the allowed NSSAI and those are neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current PLMN and registration area combination.

If the UE has neither allowed NSSAI for the current PLMN nor configured NSSAI for the current PLMN and has a default configured NSSAI, the UE shall:

- a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and
- b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has no allowed NSSAI for the current PLMN, no configured NSSAI for the current PLMN, and no default configured NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION message.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to the current PLMN, if the S-NSSAI is neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current PLMN and registration area combination.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for the current PLMN.

NOTE 3: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation.

NOTE 4: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

[TS 24.501 clause 5.5.1.2.4]

The AMF shall include the allowed NSSAI for the current PLMN and shall include the mapping of each S-NSSAI of the allowed NSSAI to the S-NSSAI(s) of the HPLMN contained in the requested NSSAI from the UE if available, in the REGISTRATION ACCEPT message if the UE included the requested NSSAI in the REGISTRATION REQUEST message and the AMF allows one or more S-NSSAIs in the requested NSSAI. The AMF may also include rejected NSSAI in the REGISTRATION ACCEPT message. Rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s).

The AMF may include a new configured NSSAI for the current PLMN in the REGISTRATION ACCEPT message if:

- a) the REGISTRATION REQUEST message did not include the requested NSSAI;
- b) the REGISTRATION REQUEST message included the requested NSSAI containing an S-NSSAI that is not valid in the serving PLMN; or
- c) the REGISTRATION REQUEST message included the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI".

If a new configured NSSAI for the current PLMN is included in the REGISTRATION ACCEPT message, the AMF shall also include the mapping of the configured NSSAI for the current PLMN the S-NSSAI(s) of the to HPLMN if available in the REGISTRATION ACCEPT message. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF shall include the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message if the UDM has indicated that the subscription data for network slicing has changed. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The UE receiving the rejected NSSAI in the REGISTRATION ACCEPT message takes the following actions based on the rejection cause in the rejected NSSAI:

"S-NSSAI not available in the current PLMN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current PLMN until switching off the UE or the UICC containing the USIM is removed.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and registration area combination as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current registration area until switching off the UE, the UE moving out of the current registration area or the UICC containing the USIM is removed.

If the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the requested NSSAI are present in the subscribed S-NSSAIs, and one or more subscribed S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) marked as default are available, the AMF shall put the subscribed S-NSSAIs marked as default in the allowed NSSAI of the REGISTRATION ACCEPT message. The AMF shall determine a registration area such that all S-NSSAIs of the allowed NSSAI are available in the registration area.

**9.1.5.1.3.3                    Test description**

**9.1.5.1.3.3.1                Pre-test conditions**

**System Simulator:**

- NGC Cell A belongs to Home PLMN and TAI-1 and set as serving cell;
- NGC Cell B belongs to Home PLMN and TAI-2 and set as Non-Suitable “Off” cell.
- NGC Cell C belongs to Home PLMN and TAI-3 and set as Non-Suitable “Off” cell.

**UE:**

- UE is previously registered on NGC Cell A using default message contents according to TS 38.508-1 [4];
- Empty URSP Configuration.

**Preamble:**

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.5.1.3.3.2

Test procedure sequence

Table 9.1.5.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		



1	The UE is switched on.	-	-	-	-
2	Check: Does UE transmit a REGISTRATION REQUEST message?	-->	REGISTRATION REQUEST	-	-
3-11	Steps 5 to 13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
12	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI and Configured NSSAI.	<--	REGISTRATION ACCEPT	-	-
13-18	Steps 15 to 20a1 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
19	Switch off procedure in RRC_IDLE specified in TS 38.508-1 subclause 4.9.6.1 is performed.	-	-	-	-
20	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
21	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	1	P
22-30	Steps 5 to 13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
31	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI and Rejected NSSAI.	<--	REGISTRATION ACCEPT	-	-
32-37	Steps 15 to 20a1 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
38	The SS configures NGC Cell A as a "Non-suitable cell" and NGC Cell C as the "Serving cell".	-	-	-	-
39	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI on NGC Cell C?	-->	REGISTRATION REQUEST	2	P
40-48	Void.	-	-	-	-
49	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
50	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
51	The SS transmits an <i>RRCRelease</i> message.	-	-	-	-
52	Check: Is S-NSSAI=2 in the Rejected NSSAI list with cause "S-NSSAI not available in the current PLMN" associated with current PLMN using AT/MMI?	-	-	2	P
53	Switch off procedure in RRC_IDLE specified in TS 38.508-1 subclause 4.9.6.1 is performed.	-	-	-	-
54	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
55	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	3	P
56-64	Steps 5 to 13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
65	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI and Rejected NSSAI.	<--	REGISTRATION ACCEPT	-	-
66-71	Steps 15 to 20a1 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
72	Check: Is S-NSSAI=2 removed from the	-	-	3	P

	Rejected NSSAI list associated with current PLMN?				
72A	Check: Is S-NSSAI=1 in the Rejected NSSAI list with cause “S-NSSAI not available in the current registration area” associated with current PLMN and registration area combination using AT/MMI?	-	-	4	P
73	The SS configures NGC Cell C as the "Non-suitable cell" and NGC Cell B as the "Serving cell".	-	-	-	-
74	Wait for 34s for FR1 or 130s for FR2 to allow UE to recognise the change, then the generic test procedure in TS 38.508-1 Table 4.9.4.2.2-1 is performed to indicate that UE camp on Cell B. (Note 1).	-	-	-	-
75-86	Void	-	-	-	-
87	Check: Is S-NSSAI=1 in the Rejected NSSAI list with cause “S-NSSAI not available in the current registration area” associated with current PLMN and registration area combination using AT/MMI?	-	-	4	P
88	The SS configures NGC Cell B as the "Non-suitable cell" and NGC Cell A as the "Serving cell".	-	-	-	-
89	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	5	P
90-98	Void	-	-	-	-
99	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
100	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
101	The SS transmits an <i>RRCR</i> elease message.	-	-	-	-
102	Check: Is S-NSSAI=1 removed from the Rejected NSSAI list associated with current PLMN and registration area combination?	-	-	5	P
Note 1: The wait time for reselection to a newly detected intra frequency cell is selected to cover $T_{\text{detect,NR\_Intra}}$ ( $25 \times 1280\text{ms} = 32\text{s}$ for FR1 and $25 \times 4 \times 1280\text{ms} = 128\text{s}$ for FR2) + $T_{\text{SI-NR}}$ (1.28s for FR1 and FR2) = 33.28s rounded up to 34s for FR1 and 129.28s rounded up to 130s for FR2.					

9.1.5.1.3.3.3 Specific message contents

Table 9.1.5.1.3.3.3-1: REGISTRATION REQUEST (step 2, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition

5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =1 will be always included from the allowed NSSAI list associated with PLMN of NCG Cell A by the UE but may include other S-NSSAI from Configured NSSAI list associated with PLMN of NCG Cell A if configured in the UE. See TS 24.501 clause 5.5.1.2.1			

Table 9.1.5.1.3.3.3-2: REGISTRATION ACCEPT (step 12, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'001'B	3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.5.1.3.3.3-3: PDU SESSION ESTABLISHMENT ACCEPT (step 14 , Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 clause 4.7.2-2			
Information Element	Value/remark	Comment	Condition
S-NSSAI			
Length of S-NSSAI contents	'0000 0001'B	SST	
SST	'0000 0010'B	SST value 2	

Table 9.1.5.1.3.3.3-4: REGISTRATION REQUEST (step 21, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition

5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =2 will be always included by the UE from the allowed NSSAI list associated with PLMN of NCG Cell A but may include S-NSSAI =1 from Configured NSSAI list associated with PLMN of NCG Cell A. See TS 24.501 sub-clause 5.5.1.2.1			

Table 9.1.5.1.3.3.3-5: REGISTRATION ACCEPT (step 31, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'001'B	3GPP access	
Allowed NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Rejected NSSAI			
Rejected S-NSSAI-1		Rejected S-NSSAI value 1	
Cause value	'0000'B	S-NSSAI not available in the current PLMN	
SST	'00000010'B	2	
SD	Not Present		
Note: If UE has requested only S-NSSAI =2 in step 21 and S-NSSAI =2 is added in the Rejected NSSAI list by the SS then AMF/SS can include default subscribed S-NSSAIs in the allowed NSSAI of REGISTRATION ACCEPT message, see TS 24.501 sub-clause 5.5.1.2.4.			

Table 9.1.5.1.3.3.3-6: REGISTRATION REQUEST (step 39, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'010'B	mobility registration updating	
Requested NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.5.1.3.3.3-7: REGISTRATION ACCEPT (step 49, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'001'B	3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.5.1.3.3.3-8: REGISTRATION REQUEST (step 55, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =1 will be always included by the UE from the allowed NSSAI list associated with PLMN of NCG Cell C but may include S-NSSAI =2 from Configured NSSAI list associated with PLMN of NCG Cell C. See TS 24.501 sub-clause 5.5.1.2.1			

Table 9.1.5.1.3.3.3-9: REGISTRATION ACCEPT (step 65, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	'001'B	3GPP access	
TAI list			
Type of list	'01'B	list of TACs belonging to one PLMN, with consecutive TAC values	
Number of elements	'00001'B	2 Elements	
TAC	PLMN =MCC/MNC stored in EF <sub>IMSI</sub> TAC 1 = 2	TAI-2, TAI-3	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Rejected NSSAI			
Rejected S-NSSAI-1		Rejected S-NSSAI value 1	
Cause value	'0001'B	S-NSSAI not available in the current registration area	
SST	'00000001'B	1	
SD	Not Present		
Note: If UE has requested only S-NSSAI =1 in step 55 and S-NSSAI =1 is added in the Rejected NSSAI list by the SS then AMF/SS can include default subscribed S-NSSAIs in the allowed NSSAI of REGISTRATION ACCEPT message, see TS 24.501 sub-clause 5.5.1.2.4.			

Table 9.1.5.1.3.3.3-10: PDU SESSION ESTABLISHMENT ACCEPT (step 67 , Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 clause 4.7.2-2			
Information Element	Value/remark	Comment	Condition
S-NSSAI			
Length of S-NSSAI contents	'0000 0001'B	SST	
SST	'0000 0010'B	SST value 2	

Table 9.1.5.1.3.3.3-11: Void

Table 9.1.5.1.3.3.3-12: Void

Table 9.1.5.1.3.3.3-13: REGISTRATION REQUEST (step 89, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition

5GS registration type value	‘010’B	mobility registration updating	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000010’B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000001’B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =2 will be always included by the UE from the allowed NSSAI list associated with PLMN of NCG Cell A but may include S-NSSAI =1 from Configured NSSAI list associated with PLMN of NCG Cell A. See TS 24.501 sub-clause 5.5.1.2.1			

Table 9.1.5.1.3.3-14: REGISTRATION ACCEPT (step 99, Table 9.1.5.1.3.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	‘001’B	3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000010’B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	Note
Length of S-NSSAI contents	‘00000001’B	SST	
SST	‘00000001’B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: SS will send allowed NSSAIs based on the Requested NSSAIs sent by UE in step 89.			

9.1.5.1.3a Initial registration / 5GS services / NSSAI handling / NSSAI Storage

9.1.5.1.3a.1 Test Purpose (TP)

(1)

with { UE is switched off with a valid USIM inserted }

ensure that {

when { UE has configured NSSAI associated with HPLMN, configured NSSAI associated with a current PLMN with mapping to the Configured NSSAI for the HPLMN and UE is powered up or switched on }

then { UE transmits REGISTRATION REQUEST message with Requested NSSAI using the configured NSSAI associated with current PLMN and mapping of each S-NSSAI of the requested NSSAI to the S-NSSAIs of the configured NSSAI for the HPLMN }

}

(2)

```
with { UE is switched off with a valid USIM inserted }

ensure that {

    when { UE has neither allowed NSSAI for the current PLMN nor configured NSSAI for the current PLMN
and has a default configured NSSAI and UE is powered up or switched on }

    then { UE transmits REGISTRATION REQUEST message with Requested NSSAI using the default
configured NSSAI and also includes Network slicing indication IE with the Default configured NSSAI
indication bit set to "Requested NSSAI created from default configured NSSAI" }

}
```

(3)

```
with { UE is switched off with a valid USIM inserted }

ensure that {

    when { UE has no allowed NSSAI for the current PLMN, no configured NSSAI for the current PLMN, and
no configured NSSAI not associated with a PLMN and UE is powered up or switched on }

    then { UE transmits REGISTRATION REQUEST message and does not include a Requested NSSAI }

}
```

9.1.5.1.3a.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.2.2 and 5.5.1.2.4.

[TS 24.501 clause 5.5.1.2.2]

5.5.1.2.1 General

This procedure can be used by a UE for initial registration for 5GS services.

...

The UE shall include the requested NSSAI containing the S-NSSAI(s) corresponding to the slice(s) to which the UE wants to register and shall include the mapping of the requested NSSAI which is the mapping of each S-NSSAI of the requested NSSAI to the S-NSSAI(s) of the HPLMN, if available, in the REGISTRATION REQUEST message. If the UE has allowed NSSAI or configured NSSAI for the current PLMN, the requested NSSAI shall be either:

- a) the configured NSSAI for the current PLMN, or a subset thereof as described below, if the UE has no allowed NSSAI for the current PLMN;
- b) the allowed NSSAI for the current PLMN, or a subset thereof as described below, if the UE has an allowed NSSAI for the current PLMN; or
- c) the allowed NSSAI for the current PLMN, or a subset thereof as described below, plus one or more S-NSSAIs from the configured NSSAI for which no corresponding S-NSSAI is present in the allowed NSSAI and those are neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current PLMN and registration area combination.

If the UE has neither allowed NSSAI for the current PLMN nor configured NSSAI for the current PLMN and has a default configured NSSAI, the UE shall:



- a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and
- b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has no allowed NSSAI for the current PLMN, no configured NSSAI for the current PLMN, and no default configured NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION message.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to the current PLMN, if the S-NSSAI is neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current PLMN and registration area combination.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for the current PLMN.

NOTE 3: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation.

NOTE 4: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

[TS 24.501 clause 5.5.1.2.4]

The AMF shall include the allowed NSSAI for the current PLMN and shall include the mapping of each S-NSSAI of the allowed NSSAI to the S-NSSAI(s) of the HPLMN contained in the requested NSSAI from the UE if available, in the REGISTRATION ACCEPT message if the UE included the requested NSSAI in the REGISTRATION REQUEST message and the AMF allows one or more S-NSSAIs in the requested NSSAI. The AMF may also include rejected NSSAI in the REGISTRATION ACCEPT message. Rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s).

The AMF may include a new configured NSSAI for the current PLMN in the REGISTRATION ACCEPT message if:

- a) the REGISTRATION REQUEST message did not include the requested NSSAI;
- b) the REGISTRATION REQUEST message included the requested NSSAI containing an S-NSSAI that is not valid in the serving PLMN; or
- c) the REGISTRATION REQUEST message included the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI".

If a new configured NSSAI for the current PLMN is included in the REGISTRATION ACCEPT message, the AMF shall also include the mapping of the configured NSSAI for the current PLMN the S-NSSAI(s) of the to HPLMN if available in the REGISTRATION ACCEPT message. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF shall include the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message if the UDM has indicated that the subscription data for network slicing has changed. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The UE receiving the rejected NSSAI in the REGISTRATION ACCEPT message takes the following actions based on the rejection cause in the rejected NSSAI:

"S-NSSAI not available in the current PLMN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current PLMN until switching off the UE or the UICC containing the USIM is removed.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and registration area combination as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current registration area until switching off the UE, the UE moving out of the current registration area or the UICC containing the USIM is removed.

If the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the requested NSSAI are present in the subscribed S-NSSAIs, and one or more subscribed S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) marked as default are available, the AMF shall put the subscribed S-NSSAIs marked as default in the allowed NSSAI of the REGISTRATION ACCEPT message. The AMF shall determine a registration area such that all S-NSSAIs of the allowed NSSAI are available in the registration area.

9.1.5.1.3a.3

Test description

9.1.5.1.3a.3.1

Pre-test conditions

System Simulator:

- NGC Cell G is configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in 38.508-1 [4] except that frequency NRf1 replaces NRf2.
- NGC Cell G belongs to VPLMN, TAI-7 and set as serving cell.

UE:

- None

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4] and camped on NGC Cell A HPLMN.

9.1.5.1.3a.3.2

Test procedure sequence

Table 9.1.5.1.3a.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The UE is switched on.			-	-
2	The UE transmits REGISTRATION REQUEST message on NGC Cell G.	-->	REGISTRATION REQUEST	-	-
3-11	Steps 5 to 13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed.	-	-	-	-
12	The SS transmits REGISTRATION ACCEPT message including Configured and Allowed NSSAI lists.	<--	REGISTRATION ACCEPT	-	-
13-18	Steps 15 to 20a1 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed with ' <i>connected without release</i> '.	-	-	-	-
19	The SS transmits NSSAI DELETE REQUEST message to delete the Allowed NSSAI list for all PLMNs (MCC-MNC =000-000) and for 3GPP access so UE has only configured NSSAI.	<--	NSSAI DELETE REQUEST	-	-
20	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
21	The SS transmits an <i>RRCR</i> elease message.	-	-	-	-
22	Switch off procedure in RRC_Idle specified in TS 38.508-1 subclause 4.9.6.1 is performed.	-	-	-	-
23	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
24	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	1	P
25-33	Steps 5 to13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed.	-	-	-	-
34	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
35-40	Steps 15 to 20a1 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed with ' <i>connected without release</i> '.	-	-	-	-
41	The SS transmits NSSAI DELETE REQUEST message to delete the Default Configured NSSAI list.	<--	NSSAI DELETE REQUEST	-	-
42	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
43	Use AT command and set Default Configured NSSAI to 1 & 2.	-	-	-	-
44	The SS transmits NSSAI DELETE REQUEST message to delete the Configured NSSAI list for all PLMNs (MCC-MNC =000-000).	<--	NSSAI DELETE REQUEST	-	-
45	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
46	The SS transmits NSSAI DELETE REQUEST message to delete the Allowed NSSAI list for all PLMNs (MCC-MNC =000-000).	<--	NSSAI DELETE REQUEST	-	-
47	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
48	The SS transmits an <i>RRCR</i> elease message.	-	-	-	-
49	Switch off procedure in RRC_Idle specified in TS 38.508-1 subclause 4.9.6.1 is performed	-	-	-	-
50	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
51	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	2	P

52-60	Steps 5 to 13 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed.	-	-	-	-
61	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
62-67	Steps 15 to 20a1 of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed with ' <i>connected without release</i> '.	-	-	-	-
68	The SS transmits NSSAI DELETE REQUEST message to delete the Default Configured NSSAI list.	<--	NSSAI DELETE REQUEST	-	-
69	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
70	The SS transmits NSSAI DELETE REQUEST message to delete the Configured NSSAI list for all PLMNs (MCC-MNC =000-000).	<--	NSSAI DELETE REQUEST	-	-
71	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
72	The SS transmits NSSAI DELETE REQUEST message to delete the Allowed NSSAI list for all PLMNs (MCC-MNC =000-000).	<--	NSSAI DELETE REQUEST	-	-
73	UE transmits NSSAI DELETE RESPONSE message.	-->	NSSAI DELETE RESPONSE	-	-
74	The SS transmits an <i>RRCRelease</i> message.	-	-	-	-
75	Switch off procedure in RRC_Idle specified in TS 38.508-1 subclause 4.9.6.1 is performed.	-	-	-	-
76	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
77	Check: Does UE transmit a REGISTRATION REQUEST message not including Requested NSSAI?	-->	REGISTRATION REQUEST	3	P
78-93	Steps 5 to 20a1of the generic procedure for NR RRC_IDLE specified in TS 38.508-1 subclause 4.5.2.2-2 are performed.	-	-	-	-

9.1.5.1.3a.3.3            Specific message contents

Table 9.1.5.1.3a.3.3-1: REGISTRATION ACCEPT (Preamble)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	'001'B	3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.1.5.1.3a.3.3-2: REGISTRATION ACCEPT (step 12, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'001'B	3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000100'B	4	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000010'B	SST and mapped configured SST	
SST	'00000100'B	4	
SD	Not Present		
Mapped configured SST	'00000001'B	1	
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000010'B	SST and mapped configured SST	
SST	'00000101'B	5	
SD	Not Present		
Mapped configured SST	'00000010'B	2	
Mapped configured SD	Not Present		

Table 9.1.5.1.3a.3.3-3: NSSAI DELETE REQUEST (step 19, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		

Message type	‘10000110’		
Delete NSSAI type	‘00000010’	Delete Allowed NSSAI	
Allowed NSSAI	000000	All PLMNs (3 Octets)	
	00	3GPP access	

Table 9.1.5.1.3a.3.3-4: NSSAI DELETE RESPONSE (step 20, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-5: REGISTRATION REQUEST (step 24, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	‘001’B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	‘00000010’B	SST and mapped configured SST	
SST	‘00000100’B	4	
SD	Not Present		
Mapped configured SST	‘00000001’B	1	
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	‘00000010’B	SST and mapped configured SST	
SST	‘00000101’B	5	
SD	Not Present		
Mapped configured SST	‘00000010’B	2	
Mapped configured SD	Not Present		
Note: UE may include S-NSSAI 4 or 5 or both 4 and 5 from the configured NSSAI list associated with NGC cell G.			

Table 9.1.5.1.3a.3.3-6: REGISTRATION ACCEPT (step 34, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	‘001’B	3GPP access	
Allowed NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	‘00000010’B	SST and mapped configured SST	
SST	‘00000100’B	4	
SD	Not Present		
Mapped configured SST	‘00000001’B	1	
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	‘00000010’B	SST and mapped configured SST	
SST	‘00000101’B	5	
SD	Not Present		
Mapped configured SST	‘00000010’B	2	
Mapped configured SD	Not Present		
Note: SS will send Allowed NSSAIs based on the Requested NSSAI sent by UE in step 24.			

Table 9.1.5.1.3a.3.3-7: NSSAI DELETE REQUEST (step 41, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10000110’		
Delete NSSAI type	‘00000000’	Delete Default Configured NSSAI	

Table 9.1.5.1.3a.3.3-8: NSSAI DELETE RESPONSE (step 42, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-9: NSSAI DELETE REQUEST (step 44, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator			
Message type	‘10000110’		
Delete NSSAI type	‘00000001’	Delete Configured NSSAI	
Configured NSSAI	00000000	All PLMNs	

Table 9.1.5.1.3a.3.3-10: NSSAI DELETE RESPONSE (step 45, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-11: NSSAI DELETE REQUEST (step 46, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10000110’		
Delete NSSAI type	‘00000010’	Delete Allowed NSSAI	
Allowed NSSAI	000000	All PLMNs (3 Octets)	
	00	3GPP access	

Table 9.1.5.1.3a.3.3-12: NSSAI DELETE RESPONSE (step 47, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-13: REGISTRATION REQUEST (step 51, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition



5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Network slicing indication			
Default configured NSSAI indication	1	Requested NSSAI created from default configured NSSAI	
Note: UE may include either 1 or 2 or both 1 and 2 NSSAIs.			

Table 9.1.5.1.3a.3.3-14: REGISTRATION ACCEPT (step 61, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'001'B	3GPP access	
Allowed NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000010'B	SST and mapped configured SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	'00000001'B		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000010'B	SST and mapped configured SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	'00000010'B		
Mapped configured SD	Not Present		
Note: SS will send Allowed NSSAIs based on the Requested NSSAI sent by UE in Step 51			

Table 9.1.5.1.3a.3.3-15: NSSAI DELETE REQUEST (step 68, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	'10000110'		
Delete NSSAI type	'00000000'	Delete Default Configured NSSAI	

Table 9.1.5.1.3a.3.3-16: NSSAI DELETE RESPONSE (step 69, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-17: NSSAI DELETE REQUEST (step 70, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10000110’		
Delete NSSAI type	‘00000001’	Delete Configured NSSAI	
Configured NSSAI	000000	All PLMNs (3 Octets)	

Table 9.1.5.1.3a.3.3-18: NSSAI DELETE RESPONSE (step 71, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-19: NSSAI DELETE REQUEST (step 72, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	<b>0000</b>		
Message type	‘10000110’		
Delete NSSAI type	‘00000010’	Delete Allowed NSSAI	
Allowed NSSAI	000000	All PLMNs (3 Octets)	
	00	3GPP access	

Table 9.1.5.1.3a.3.3-20: NSSAI DELETE RESPONSE (step 73, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.509 Table 6.7.1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1111		
Skip indicator	0000		
Message type	‘10100111’		

Table 9.1.5.1.3a.3.3-21: REGISTRATION REQUEST (step 77, Table 9.1.5.1.3a.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	‘001’B	Initial registration	
Requested NSSAI	Not Present		

9.1.5.1.4 Initial registration / 5GS services / MICO mode / TAI list handling

9.1.5.1.4.1 Test Purpose (TP)

(1)

with { The UE is in 5GMM-DEREGISTERED state and is switched off }

ensure that {

    when { the UE supports MICO mode and requests the use of MICO mode}

        then { the UE includes the MICO indication IE in the REGISTRATION REQUEST message }

    }

(2)

with { The UE has received REGISTRATION ACCEPT message }

ensure that {

    when { the REGISTRATION ACCEPT message included MICO indication IE indicating “all PLMN registration area allocated” }

        then { the UE treats all TAIs in the current PLMN as a registration area and deletes its old TAI list }

    }

(3)

with { The UE detecting a better NG cell in same PLMN }

ensure that {

```
    when { the UE treats all TAIs in the current PLMN as a registration area and has deleted its old
    TAI list as a result of REGISTRATION ACCEPT message included MICO indication IE indicating "all PLMN
    registration area allocated" }

    then { the UE does not perform the REGISTRATION procedure for mobility }

}
```

(4)

```
with { The UE detecting a better NG cell in a different PLMN }

ensure that {

    when { the UE transmits the REGISTRATION REQUEST }

        then { the UE sets the IE 5GS registration type to "mobility registration updating" and performs
        a REGISTRATION procedure for Mobility }

}
```

9.1.5.1.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.2.2 and 5.5.1.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.2]

...

If the UE supports MICO mode and requests the use of MICO mode, then the UE shall include the MICO indication IE in the REGISTRATION REQUEST message.

...

[TS 24.501, clause 5.5.1.2.4]

...

The AMF shall include the MICO indication IE in the REGISTRATION ACCEPT message only if the MICO indication IE was included in the REGISTRATION REQUEST message, the AMF supports and accepts the use of MICO mode. If the AMF supports and accepts the use of MICO mode, the AMF may indicate "all PLMN registration area allocated" in the MICO indication IE in the REGISTRATION ACCEPT message. If "all PLMN registration area allocated" is indicated in the MICO indication IE, the AMF shall not assign and include the TAI list in the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message included an MICO indication IE indicating "all PLMN registration area allocated", the UE shall treat all TAIs in the current PLMN as a registration area and delete its old TAI list.

...

9.1.5.1.4.3

Test description

9.1.5.1.4.3.1

Pre-test conditions

System Simulator:

- NGC Cell A, NGC Cell C and NGC Cell E are configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in TS 38.508-1 [4].

UE:

None.

Preamble:

- The UE is in state Switched OFF (State 0-A) as per TS 38.508-1 [4] Table 4.4A.2-0.

9.1.5.1.4.3.2

Test procedure sequence

Table 9.1.5.1.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
0	The SS configures: - NGC Cell A as the "Non-Suitable "off" cell. - NGC Cell C as the "Non-Suitable "off" cell". - NGC Cell E as the "Non-Suitable "off" cell".				

1	The UE is switched ON				
2	The user requests enabling of MICO mode by MMI or AT command	-		-	-
3	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell C as the "Non-Suitable "off" cell". - NGC Cell E as the "Non-Suitable "off" cell".	-		-	-
4-6	The UE establishes an RRC connection by executing steps 2–4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-		-	-
7	Check : Does the UE transmit a REGISTRATION REQUEST message including IE MICO indication	-->	REGISTRATION REQUEST	1	P
8-16	Steps 5-13 of Table 4.5.2.2-2 of the generic procedure in TS 38508-1 [4] are performed	-		-	-
17	SS transmits a REGISTRATION ACCEPT message that includes IE MICO indication	<--	REGISTRATION ACCEPT	-	-
18	The SS releases the RRC Connection	-		-	-
19	The SS configures: - NGC Cell A as the "Non-suitable cell". - NGC Cell C as the "Serving cell". - NGC Cell E as the "Non-suitable cell".	-			
20	Check : Does the UE transmit a RRCSetupRequest on NGC Cell C ? This is checked for 60s	-->	NR RRC: <i>RRCSetupRequest</i>	2,3	F
21	The SS configures: - NGC Cell A as the "Non-suitable cell". - NGC Cell C as the "Non-suitable cell". - NGC Cell E as the "Serving cell".	-		-	-
	The following messages are to be observed on NGC Cell E unless explicitly stated otherwise				
22-24	The UE establishes an RRC connection by executing steps 2–4 of Table 4.5.2.2-2 in TS38.508-1 [4].	-		-	-
25	Check : Does the UE transmit a REGISTRATION REQUEST message with IE 5GS registration type set to “mobility registration updating”	-->	REGISTRATION REQUEST	4	P
26-27	Steps 4–5 of Table 4.9.5.2.2-1 in TS38.508-1 [4] are performed				

9.1.5.1.4.3.3 Specific message contents

Table 9.1.5.1.4.3.3-1: REGISTRATION REQUEST (step 6 Table 9.1.5.1.4.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'001'B	Initial registration	INITIAL
MICO indication	'0000'B		

Table 9.1.5.1.4.3.3-2: REGISTRATION ACCEPT (step 16 Table 9.1.5.1.4.3.2-1)

Derivation Path: TS 38.508 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

MICO Indication	‘0001’B	All PLMN registration area allocated	
TAI list	Not present		

Table 9.1.5.1.4.3.3-3: REGISTRATION REQUEST (step 23 Table 9.1.5.1.4.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	‘010’B	Mobility registration updating	MOBILITY

9.1.5.1.5 Initial registration / Abnormal / Failure after 5 attempts

9.1.5.1.5.1 Test Purpose (TP)

(1)

with { The UE in 5GMM-REGISTERED-INITIATED state and T3510 timer expired }

ensure that {

    when { T3511 timer expires and registration attempt counter is less than 5 }

        then { UE restarts the initial registration procedure }

    }

(2)

with { The UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { The NAS signalling connection is released before the REGISTRATION ACCEPT or REGISTRATION REJECT message is received }

        then { UE restarts the initial registration procedure }

    }

(3)

with { The UE has sent initial REGISTRAION REQUEST message }

ensure that {

    when { UE receives a REGISTRATION REJECT message including 5GMM cause value #95 and the UE updates the registration counter to 5 }

        then { UE deletes 5G-GUTI, last visited TAI and ngKSI, performs a PLMN selection after timer T3502 timeout }

    }

}

#### 9.1.5.1.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.1, 5.5.1.2.7, and 10.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.1]

Additionally, the registration attempt counter shall be reset when the UE is in sub state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION or 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE, and:

- a new tracking area is entered;
- timer T3502 expires; or
- timer T3346 is started.

[TS 24.501, clause 5.5.1.2.7]

The following abnormal cases can be identified:

...

c) T3510 timeout.

The UE shall abort the registration procedure for initial registration and the NAS signalling connection, if any, shall be released locally if the initial registration request is not for emergency services. The UE shall proceed as described below.

d) REGISTRATION REJECT message, other 5GMM cause values than those treated in subclause 5.5.1.2.5, and cases of 5GMM cause value #22, if considered as abnormal cases according to subclause 5.5.1.2.5.

If the registration request is not an initial registration request for emergency services, upon reception of the 5GMM causes #95, #96, #97, #99 and #111 the UE should set the registration attempt counter to 5.

The UE shall proceed as described below.

e) Lower layer failure or release of the NAS signalling connection received from lower layers before the REGISTRATION ACCEPT or REGISTRATION REJECT message is received.

The UE shall abort the registration procedure for initial registration and proceed as described below.

...

For the cases c, d and e, the UE shall proceed as follows:

Timer T3510 shall be stopped if still running.

If the registration procedure is neither an initial registration for emergency services nor for establishing an emergency PDU session with registration type not set to "emergency registration", the registration attempt counter shall be incremented, unless it was already set to 5.

If the registration attempt counter is less than 5:

- if the initial registration request is not for emergency services, timer T3511 is started and the state is changed to 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION. When timer T3511 expires the registration procedure for initial registration shall be restarted, if still required.



If the registration attempt counter is equal to 5

- the UE shall delete 5G-GUTI, TAI list, last visited TAI, list of equivalent PLMNs and ngKSI, start timer T3502 and shall set the 5GS update status to 5U2 NOT UPDATED. The state is changed to 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION or optionally to 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

[TS 24.501, clause 10.2]

Table 10.2.1: Timers of 5GS mobility management – UE side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON EXPIRY
T3510	15s	5GMM-REGISTERED-INITIATED	Transmission of REGISTRATION REQUEST message	REGISTRATION ACCEPT message received or REGISTRATION REJECT message received	Start T3511 or T3502 as specified in subclause 5.5.1.2.7 if T3510 expired during registration procedure for initial registration.  Start T3511 or T3502 as specified in subclause 5.5.1.3.7 if T3510 expired during the registration procedure for mobility and periodic registration update
T3502	Default 12 min. NOTE 1	5GMM-REGISTERED	At registration failure and the attempt counter is equal to 5	Transmission of REGISTRATION REQUEST message	Initiation of the registration procedure, if still required
T3511	10s	5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION  5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE  5GMM-REGISTERED.NORMAL-SERVICE	At registration failure due to lower layer failure, T3510 timeout or registration rejected with other 5GMM cause values than those treated in subclause 5.5.1.2.5 for initial registration or subclause 5.5.1.3.5 for mobility and periodic registration	Transmission of REGISTRATION REQUEST message  5GMM-CONNECTED mode entered (NOTE 5)	Retransmission of the REGISTRATION REQUEST, if still required

9.1.5.1.5.3

Test description

9.1.5.1.5.3.1

Pre-test conditions

System Simulator:

- NGC Cell A is configured according to Table 6.3.2.2-1 in TS 38.508-1 [4].

UE:

None.

Preamble:

- The UE is in state 0-A according to TS 38.508-1 [4] Table 4.4A.2-0.

9.1.5.1.5.3.2 Test procedure sequence

Table 9.1.5.1.5.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell A as the "Serving cell".	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
2	The UE is switched on.	-	-	-	-
3-5	Steps 2-4 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed and the UE transmits a REGISTRATION REQUEST with IE 5GS registration type set to "initial registration".	-->	REGISTRATION REQUEST	-	-
6	The SS waits 25 seconds (15 seconds T3510 and 10 seconds T3511). (UE's registration attempt counter = 1)	-	-	-	-
7	Check: Does the UE transmit a REGISTRATION REQUEST message with IE 5GS registration type set to "initial registration"?	-->	REGISTRATION REQUEST	1	P
8	The SS releases the RRC connection.	-	-	-	-
8A	The SS waits 10 seconds (T3511). (UE's registration attempt counter = 2)				
9-11	Steps 2-4 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed. Check: Does the UE transmit a REGISTRATION REQUEST message with IE 5GS registration type set to "initial registration"?	-->	REGISTRATION REQUEST	2	P
12-16	Steps 5-9 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
17	The SS transmits a REGISTRATION REJECT with cause #95 (Semantically incorrect message). (UE's registration attempt counter = 5)	<--	REGISTRATION REJECT	-	-
17A	The SS releases the RRC connection.	-	-	-	-
	EXCEPTION: Steps 17Aa1 and 17Ab1 describes behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that take place if a capability is supported				
17Aa1	IF the UE transmits a REGISTRATION REQUEST message with IE 5GS registration type set to "initial registration" 10s after step 17A.	-->	REGISTRATION REQUEST	-	-
17Ab1	ELSE Check: Does the UE transmit a REGISTRATION REQUEST message with IE 5GS registration type set to "initial registration" after 12 minutes after step 17A? (UE's registration attempt counter has been reset to 0 after expiry of T3502)	-->	REGISTRATION REQUEST	3	P
18	Void	-	-	-	-
19-34	Steps 5-20a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-

9.1.5.1.5.3.3            Specific message contents

Table 9.1.5.1.5.3.3-1: REGISTRATION REJECT (step 17, Table 9.1.5.1.5.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'01011111'B	Cause #95 (Semantically incorrect message)	

Table 9.1.5.1.5.3.3-2: REGISTRATION REQUEST (step 18, Table 9.1.5.1.5.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	no key is available	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	SUCI		
Last visited registered TAI	Not present		

Table 9.1.5.1.5.3.3-3: Void

9.1.5.1.6                Initial registration / Rejected / Illegal UE

9.1.5.1.6.1             Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS sends a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value #3 (Illegal UE) }

then { the UE deletes the stored 5G-GUTI, last visited registered TAI and ngKSI, deletes the list of equivalent PLMNs and enter state 5GMM-DEREGISTERED, the USIM is considered invalid until switching off the UE }

    }

9.1.5.1.6.2             Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clause 5.5.1.2.5.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

#3 (Illegal UE); or

#6 (Illegal ME).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall consider the USIM as invalid for 5GS services until switching off or the UICC containing the USIM is removed. The UE shall delete the list of equivalent PLMNs and enter the state 5GMM-DEREGISTERED.

If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value. The USIM shall be considered as invalid also for non-EPS services until switching off or the UICC containing the USIM is removed.

If the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

9.1.5.1.6.3

Test description

9.1.5.1.6.3.1

Pre-test conditions

System Simulator:

- NGC Cell A is configured according to table 6.3.2.2-1 in TS 38.508-1 [4].

UE:

None.

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.5.1.6.3.2

Test procedure sequence

Table 9.1.5.1.6.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The SS configures: - NGC cell A as the "Serving cell".	-	-	-	-
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
2	The UE is switched on.	-	-	-	-
3-14	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
15	The SS transmits a REGISTRATION REJECT message with the 5GMM cause set to 'Illegal UE' as specified.	<--	5GMM: REGISTRATION REJECT	-	-
16	The SS releases the RRC connection.	-	-	-	-
17	Check: Does the UE transmit an REGISTRATION REQUEST message on NGC cell A in the next 30 seconds?	-->	5GMM: REGISTRATION REQUEST	1	F
18	The user initiates Registration Request by MMI or by AT command.	-	-	-	-
19	Check: Does the UE transmit the REGISTRATION REQUEST message in the next 30 seconds?	-->	5GMM: REGISTRATION REQUEST	1	F
20	If possible (see ICS) switch off is performed or the USIM is removed. Otherwise the power is removed.	-	-	-	-
21	The UE is brought back to operation or the USIM is inserted. The UE is powered on or switched on.	-	-	-	-
22	Check: Does the UE transmit an REGISTRATION REQUEST message on NGC Cell A?	-->	5GMM: REGISTRATION REQUEST	1	P
23-38	Steps 5-20 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed on NGC Cell A.	-	-	-	-

9.1.5.1.6.3.3 Specific message contents

Table 9.1.5.1.6.3.3-1: REGISTRATION REJECT (step 15, Table 9.1.5.1.6.3.2-1)

Derivation Path: TS 38.508-1 Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0000 0011'B	Illegal UE	

Table 9.1.5.1.6.3.3-2: REGISTRATION REQUEST (step 22, Table 9.1.5.1.6.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	no key is available (UE to network)	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	The valid SUCI	.	
Last visited registered TAI	Not present		

9.1.5.1.7

Void

9.1.5.1.8

Initial registration / Rejected / Serving network not authorized

9.1.5.1.8.1

Test Purpose (TP)

(1)

```
with { The UE has sent initial REGISTRAION REQUEST message }  
  
ensure that {  
  
    when { the UE receives a REGISTRATION REJECT with cause #73 (Serving network not authorized) }  
  
        then { the UE stores the PLMN identity in the "forbidden PLMN list" and does not attempt to  
register on a cell belong to that PLMN }  
  
}
```

9.1.5.1.8.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.2.5.  
Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

- #3 (Illegal UE); or
- #6 (Illegal ME).
- ....
- #73 (Serving network not authorized).

The UE shall set the 5GS update status to 5U2 NOT UPDATED, reset the registration attempt counter, store the PLMN identity in the "forbidden PLMN list" and enter state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

9.1.5.1.8.3

Test description

9.1.5.1.8.3.1

Pre-test conditions

System Simulator:

- 3 NGC Cells NGC Cell E, NGC Cell I and NGC Cell A are configured as specified in TS 38.508-1[4] table 6.3.2.2-1 and table 6.3.2.2-3.

UE:

- The UE is in Automatic PLMN selection mode.

Preamble:

- NGC Cell E is set to “Serving Cell”.
- NGC Cell I is set to “Non-Suitable cell”.
- NGC Cell A is set to “Non-Suitable cell”.
- The UE is in state 0N-B with a successful registration on NGC Cell E according to 38.508-1[4].

9.1.5.1.8.3.2 Test procedure sequence

Table 9.1.5.1.8.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on	-	-	-	-
2-9	Steps 2-9 of Table 4.5.2.2-2 in TS38.508-1 [4] are performed on NGC Cell E.	-	-	-	-
10	The SS transmits a REGISTRATION REJECT with cause #73 (Serving network not authorized).	<--	REGISTRATION REJECT	-	-
11	The SS releases the RRC connection	-	-	-	-
11 A	The SS configures - NGC Cell I as “Suitable neighbour cell”	-	-	-	-
12	Check: Does the UE send in the next 30 sec a request for RRC connection establishment on Cell E or Cell I.	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
13	The SS configures - NGC Cell A as “Serving Cell”	-	-	-	-
14	Check: Does the UE perform Registration procedure on NGC Cell A as specified in TS 38.508-1 [4] subclause 4.5.2?	-	-	1	P
14 A	Switch off procedure in RRC_IDLE specified in TS 38.508-1 subclause 4.9.6.1 is performed.	-	-	-	-
15	The SS configures - NGC Cell A as “Non-Suitable “Off” cell”	-	-	-	-
15 A	The UE is brought back to operation or the USIM is inserted. The UE is powered on or switched on.	-	-	-	-
16	Set the UE in manual PLMN selection mode or request a PLMN search.	-	-	-	-
17	The user selects the PLMN of NGC Cell E.	-	-	-	-
18	The UE performs Registration procedure on NGC Cell E as specified in TS 38.508-1 [4] subclause 4.5.2.	-	-	-	-
19	Set the UE in Automatic PLMN selection mode.	-	-	-	-



9.1.5.1.8.3.3

Specific message contents

Table 9.1.5.1.8.3.3-1: REGISTRATION REJECT (step 10 Table 9.1.5.1.8.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'01001001'B	Cause #73 (Serving network not authorized)	

9.1.5.1.9

Initial registration / Abnormal / Change of cell into a new tracking area

9.1.5.1.9.1

Test Purpose (TP)

(1)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {
  when { the UE changes into a new tracking area before UE receives the REGISTRATION ACCEPT message }

  then { the UE shall abort the registration procedure for initial registration and re-initiate it immediately }

}
```

9.1.5.1.9.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.2.7.

[TS 24.501, clause 5.5.1.2.7]

The following abnormal cases can be identified:

- ...
- h) Change of cell into a new tracking area.

If a cell change into a new tracking area occurs before the registration procedure for initial registration is completed, the registration procedure for initial registration shall be aborted and re-initiated immediately. If a tracking area border is crossed when the REGISTRATION ACCEPT message has been received but before a REGISTRATION COMPLETE message is sent, the registration procedure for initial registration shall be re-initiated. If a 5G-GUTI was allocated during the registration procedure, this 5G-GUTI shall be used in the registration procedure.

9.1.5.1.9.3

Test description

9.1.5.1.9.3.1

Pre-test conditions

System Simulator:

- NGC Cell A is configured according to Table 6.3.2.2-1 in TS 38.508-1 [4].
- The defaultPagingCycle in SIB1 of NGC Cell A shall be set as rf32.

UE:

- the UE is previously registered on NGC, and when on NGC, the UE is last authenticated and registered on NGC cell A using default message contents according to TS 38.508-1 [4].

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.5.1.9.3.2 Test procedure sequence

Table 9.1.5.1.9.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Void.	-	-	-	-
2	The UE is switched on.	-	-	-	-
3-14	Steps 2–13 of Table 4.5.2.2-2 in TS38.508-1 [4] are performed.	-	-	-	-
15	SS does not send REGISTRATION ACCEPT to the UE and update TAC value in SIB1.	-	-	-	-
15A	Void.	-	-	-	-
16	The SS notifies the UE of change of System Information on NGC Cell A by sending Short Message on PDCCH using P-RNTI.	<--	NR RRC: <i>Paging</i>	-	-
16A-28	Void.	-	-	-	-
29	Check: Does the UE transmit an REGISTRATION REQUEST message before the 15 second timer (T3510) started in step 5 expires?	-	5GMM: REGISTRATION REQUEST	1	P
29A1	The SS transmits a REGISTRATION ACCEPT message.	<--	REGISTRATION ACCEPT	-	-
29A2	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
30-32	Steps 19a1-19Aa2 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-

9.1.5.1.9.3.3 Specific message contents

Table 9.1.5.1.9.3.3-0A: SIB1 of NGC Cell A (preamble)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
servingCellConfigCommon SEQUENCE {			
pcch-Config SEQUENCE {			
defaultPagingCycle	rf32		
}			
}			
}			

Table 9.1.5.1.9.3.3-0: SIB1 of NGC Cell A (step 15, Table 9.1.5.1.9.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
cellAccessRelatedInfo SEQUENCE {			
PLMN-IdentityInfoList SEQUENCE {			
trackingAreaCode	2		
}			
}			
}			

Table 9.1.5.1.9.3.3-1: Void

Table 9.1.5.1.9.3.3-1A: Void

Table 9.1.5.1.9.3.3-2: REGISTRATION REQUEST (step 29, Table 9.1.5.1.9.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type		.	
5GS registration type value	'001'B	Initial registration	

9.1.5.1.10 Initial registration / Rejected / PLMN not allowed

9.1.5.1.10.1 Test Purpose (TP)

(1)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS sends a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause
value #11 (PLMN not allowed) }

    then { the UE deletes any 5G-GUTI, last visited registered TAI and ngKSI, deletes the list of
equivalent PLMNs, stores the PLMN identity in the "forbidden PLMN list" and performs a PLMN
selection }

}
```

9.1.5.1.10.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.5.1.2.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

...

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

#11 (PLMN not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall delete the list of equivalent PLMNs and reset the registration attempt counter and store the PLMN identity in the "forbidden PLMN list". The UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform a PLMN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the PLMN-specific attempt counter and the PLMN-specific attempt counter for non-3GPP access for that PLMN to the UE implementation-specific maximum value.

9.1.5.1.10.3            Test description

9.1.5.1.10.3.1        Pre-test conditions

System Simulator:

- NGC cell G and NGC cell I.
- The NGC cells are configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in 38.508-1 [4], except replacing NRf3 with NRf1;

UE:

- the UE is previously registered on NGC, and when on NGC, the UE is last authenticated and registered on NGC cell G using default message contents according to TS 38.508-1 [4];

Preamble:

- The UE is in state 0N-B according to TS 38.508-1 [4].

9.1.5.1.10.3.2        Test procedure sequence

Table 9.1.5.1.10.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		

1	The SS configures: - NGC Cell G as the "Serving cell". - NGC Cell I as a "Non-Suitable Off cell".	-	-	-	-
2	Void				
	The following messages are to be observed on Cell G unless explicitly stated otherwise.	-	-	-	-
3	The UE is switched on.	-	-	-	-
4-11	Steps 2-9 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
12	The SS transmits an REGISTRATION REJECT message including an appropriate 5GMM cause value #11 (PLMN not allowed).	<--	5GMM: REGISTRATION REJECT	-	-
13	The SS releases the RRC connection.	-	-	-	-
14	Check: Does the UE transmit an REGISTRATION REQUEST message on NGC cell G in the next 90 seconds?	-->	5GMM: REGISTRATION REQUEST	1	F
15	The generic test procedure in TS 38.508-1 Table 4.9.6.4-1 of Switch off procedure in State DEREGISTERED are performed.	-	-	-	-
16	The UE is brought back to operation or the USIM is inserted. The UE is powered on or switched on.	-	-	-	-
17	Check: Does the UE transmit an REGISTRATION REQUEST message in the next 30 seconds?	-->	5GMM: REGISTRATION REQUEST	1	F
18	The SS configures: -NGC Cell G as the "Serving cell" -NGC Cell I as a "Suitable neighbour cell".	-	-	-	-
19	Void				
-	The following messages are to be observed on NGC Cell I unless explicitly stated otherwise.	-	-	-	-
20-22	The UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1 [4].	-	-	-	-
23	Check: Does the UE transmit an REGISTRATION REQUEST message as specified?	-->	5GMM: REGISTRATION REQUEST	1	P
24-39a1	Steps 5-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
40	The generic test procedure in TS 38.508-1 Table 4.9.6.3-1 of Switch off procedure in RRC_CONNECTED are performed.	-	-	-	-
40 A	The SS configures: -NGC Cell G as the "Serving cell" -NGC Cell I as a "Non-Suitable "off" cell ".				
40 B	The UE is brought back to operation or the USIM is inserted. The UE is powered on or switched on.	-	-	-	-
40 C	The user sets the UE in manual PLMN selection mode or requests a PLMN search.	-	-	-	-
41	The user selects PLMN of NGC Cell I.	-	-	-	-
42-60a1	Steps 2 to 20a1 of the registration procedure described in TS 38.508-1 [4] subclause 4.5.2 are performed on NGC Cell G.	-	-	-	-
61	The user sets the UE in Automatic PLMN selection mode.	-	-	-	-

9.1.5.1.10.3.3

Specific message contents

Table 9.1.5.1.10.3.3-1: Message REGISTRATION REJECT (step 12, Table 9.1.5.1.10.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-9			
Information Element	Value/Remark	Comment	Condition
5GMM cause	'00001011'B	#11 "PLMN not allowed"	

Table 9.1.5.1.10.3.3-2: Message REGISTRATION REQUEST (step 23, Table 9.1.5.1.10.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	no key is available (UE to network)	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	The valid SUCI	.	
Last visited registered TAI	Not present		

9.1.5.1.11

Initial registration / Rejected / Tracking area not allowed

9.1.5.1.11.1

Test Purpose (TP)

(1)

```
with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS sends a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value #12 (Tracking area not allowed)}

        then { the UE deletes any 5G-GUTI, last visited registered TAI and ngKSI, stores the current TAI in the list of "5GS forbidden tracking areas for regional provision of service". }

}
```

(2)

```
with { the UE is in 5GMM-DEREGISTERED.LIMITED-SERVICE state and the TAI of the current cell belongs to the list of "forbidden tracking areas for regional provision of service"}

ensure that {

    when { the UE enters a cell belonging to a tracking area not in the list of "forbidden tracking areas for regional provision of service"}

        then { the UE attempts to registration }

}
```

(3)

**with** { the UE is in 5GMM-DEREGISTERED.LIMITED-SERVICE state and the list of "forbidden tracking areas for regional provision of service" contains more than one TAI}

**ensure that** {

**when** { the UE selects a cell belonging to one of the TAIs in the list of "forbidden tracking areas for regional provision of service" }

**then** { the UE does not attempt to registration }

    }

(4)

**with** { the UE is switched off or the UICC containing the USIM is removed }

**ensure that** {

**when** { UE is powered on in the cell belonging to the TAI which was in the list of "forbidden tracking areas for regional provision of service" before the UE was switched off or the USIM is inserted again on that cell }

**then** { UE performs registration on that cell }

    }

9.1.5.1.11.2                      Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clauses 5.5.1.2.5, 5.1.3.2.2.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

- #12    (Tracking area not allowed).  
  
    The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter.  
  
    The UE shall store the current TAI in the list of "5GS forbidden tracking areas for regional provision of service" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE.

[TS 24.501, clause 5.1.3.2.2]

In order to describe the detailed UE behaviour, the 5GS update (5U) status pertaining to a specific subscriber is defined.

If the UE is not SNPN enabled or the UE is not operating in SNPN access mode (see 3GPP TS 23.501 [8]), the 5GS update status is stored in a non-volatile memory in the USIM if the corresponding file is present in the USIM, else in the non-volatile memory in the ME, as described in annex C.

If the UE is operating in SNPN access mode, the 5GS update status for each SNPN whose SNPN identity is included in the "list of subscriber data" configured in the ME (see 3GPP TS 23.122 [5]) is stored in the non-volatile memory in the ME as described in annex C.

The 5GS update status value is changed only after the execution of a registration, network-initiated de-registration, 5GS based primary authentication and key agreement, service request or paging procedure.

5U1: UPDATED

The last registration attempt was successful.

5U2: NOT UPDATED

The last registration attempt failed procedurally, e.g. no response or reject message was received from the AMF.

5U3: ROAMING NOT ALLOWED

The last registration, service request, or registration for mobility or periodic registration update attempt was correctly performed, but the answer from the AMF was negative (because of roaming or subscription restrictions).

[TS 24.501, clause 5.3.13]

The UE shall store a list of "5GS forbidden tracking areas for roaming", as well as a list of "5GS forbidden tracking areas for regional provision of service". Within the 5GS, these lists are managed independently per access type, i.e., 3GPP access or non-3GPP access. These lists shall be erased when

- a) the UE is switched off or the UICC containing the USIM is removed or an entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated; and
- b) periodically (with a period in the range 12 to 24 hours).

Over 3GPP access, when the lists are erased, the UE performs cell selection according to 3GPP TS 38.304 [28]. A tracking area shall be removed from the list of "5GS forbidden tracking areas for roaming", as well as the list of "5GS forbidden tracking areas for regional provision of service", if the UE receives the tracking area in the TAI list or the Service area list of "allowed tracking areas" in REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message. The UE shall not remove the tracking area from "5GS forbidden tracking areas for roaming" or "5GS forbidden tracking areas for regional provision of service" if the UE is registered for emergency services.

In N1 mode, the UE shall update the suitable list whenever a REGISTRATION REJECT, SERVICE REJECT or DEREGISTRATION REQUEST message is received with the 5GMM cause #12 "tracking area not allowed", #13 "roaming not allowed in this tracking area", or #15 "no suitable cells in tracking area".

Each list shall accommodate 40 or more TAIs. When the list is full and a new entry has to be inserted, the oldest entry shall be deleted.

9.1.5.1.11.3

Test description

9.1.5.1.11.3.1

Pre-test conditions

System Simulator:

- NGC Cell A (home PLMN) and NGC Cell B (home PLMN, another TA) are configured according to Table 6.3.2.2-1 in TS 38.508-1 [4].



- System information combination NR-2 in accordance with TS 38.508-1[4] sub-clause 4.4.3.1.2 is used in NGC Cell A and NGC Cell B.
- The UE is last authenticated and registered on NGC Cell A.

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.5.1.11.3.2

Test procedure sequence

Table 9.1.5.1.11.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell B as "Non-suitable cell".	-	-	-	-
2	The UE is switched on.	-	-	-	-
3-14	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
15	The SS transmits a REGISTRATION REJECT message, 5GMM cause value = #12 "Tracking area not allowed".	<--	REGISTRATION REJECT	-	-
16	The SS releases the RRC connection.	-	-	-	-
17	Check: Does the UE transmit the REGISTRATION REQUEST message on NGC Cell A in the next 30 seconds?	-->	REGISTRATION REQUEST	1	F
18	The SS reconfigures: - NGC cell B as the "Serving cell". - NGC cell A as a " Non-Suitable cell".	-	-	-	-
19	Check: Does the UE transmit the REGISTRATION REQUEST message on NGC Cell B?	-->	REGISTRATION REQUEST	1,2	P
20-26	Steps 5 to 11 from procedure in TS 38.508-1 [4] Table 4.5.2.2-2 are performed.	-	-	-	-
27	The SS transmits a REGISTRATION REJECT message, 5GMM cause value = #12 "Tracking area not allowed".	<--	REGISTRATION REJECT	-	-
28	The SS releases the RRC connection.	-	-	-	-
28A	The SS reconfigures: - NGC cell A as a "Suitable neighbour intra-frequency cell".	-	-	-	-
29	Check: Does the UE transmit the REGISTRATION REQUEST message in the next 30 seconds on NGC Cell A or NGC Cell B?	-->	REGISTRATION REQUEST	1,3	F
30	Switch off UE in State Deregistered as described in TS38.508-1 [4] subclause 4.9.6.4.	-	-	-	-
31	The SS reconfigures: - NGC cell A as the "Serving cell". - NGC cell B as "Non-suitable cell".	-	-	-	-
32	Switch on UE.	-	-	-	-
33	Check: Does the UE transmit a REGISTRATION REQUEST message on NGC Cell A?	-->	REGISTRATION REQUEST	4	P
34-49a1	Steps 5-20a1 of Table 4.5.2.2-2 in TS38.508-1 [4] are performed.	-	-	-	-

9.1.5.1.11.3.3 Specific message contents

Table 9.1.5.1.11.3.3-1: REGISTRATION REJECT (step 15, step 27, Table 9.1.5.1.11.3.2-1)

Derivation path: TS 38.508-1 [4] table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'00001100'B	#12 "Tracking area not allowed"	

Table 9.1.5.1.11.3.3-2: REGISTRATION REQUEST (step 19, step33, Table 9.1.5.1.11.3.2-1)

Derivation path: TS 38.508-1 [4] table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	no key is available	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	The valid SUCI	Only SUCI is available.	
Last visited registered TAI	Not present		

9.1.5.1.12 Initial registration / Rejected / Roaming not allowed in this tracking area

9.1.5.1.12.1 Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the SS sends a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value #13 (Roaming not allowed in this tracking area)

    then { the UE deletes any 5G-GUTI, last visited registered TAI and ngKSI, deletes the list of equivalent PLMNs, stores the current TAI in the list of "5GS forbidden tracking areas for roaming" }

    }

(2)

with { the initial registration request cannot be accepted by the network }

ensure that {

    when { the SS sends a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value #13 (Roaming not allowed in this tracking area)}

    then { The UE performs a PLMN selection }

    }

(3)

with { the UE is in 5GMM-DEREGISTERED.LIMITED-SERVICE or 5GMM-DEREGISTERED.PLMN-SEARCH state and the TAI of the current cell belongs to the list of "forbidden tracking areas for roaming"}

ensure that {

    when { the UE enters a cell belonging to a tracking area not in the list of "forbidden tracking areas for roaming"}

        then { the UE attempts to registration }

    }

(4)

```
with { the UE is in 5GMM-DEREGISTERED.LIMITED-SERVICE or 5GMM-DEREGISTERED.PLMN-SEARCH state and the
list of "forbidden tracking areas for roaming" contains more than one TAI}

ensure that {

    when { the UE selects a cell belonging to one of the TAIs in the list of "forbidden tracking areas
for roaming" }

        then { the UE does not attempt to registration }

}
```

(5)

```
with { the UE is switched off or the UICC containing the USIM is removed }

ensure that {

    when { UE is powered on in the cell belonging to the TAI which was in the list of "forbidden
tracking areas for roaming" before the UE was switched off or the USIM is inserted again on that
cell }

        then { UE performs registration on that cell }

}
```

9.1.5.1.12.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.5.1.2.5, 5.1.3.2.1, 5.1.3.2.2, TS 23.122 clauses 3.1.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

#13 (Roaming not allowed in this tracking area).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall delete the list of equivalent PLMNs and reset the registration attempt counter.

The UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE or optionally 5GMM-DEREGISTERED.PLMN-SEARCH. The UE shall perform a PLMN selection according to 3GPP TS 23.122 [5].

...

[TS 24.501, clause 5.1.3.2.1.3.3]

The sub state 5GMM-DEREGISTERED.LIMITED-SERVICE is chosen in the UE, when it is known that a selected cell for 3GPP access or TA for non-3GPP access is unable to provide normal service (e.g. the selected cell over 3GPP access is in a forbidden PLMN or is in a forbidden tracking area or TA for non-3GPP access is forbidden).

[TS 24.501, clause 5.1.3.2.1.3.5]

The sub state 5GMM-DEREGISTERED.PLMN-SEARCH is chosen in the UE, if the UE is searching for PLMNs. This sub state is left either when a cell has been selected (the new sub state is NORMAL-SERVICE or LIMITED-SERVICE) or when it has been concluded that no cell is available at the moment (the new sub state is NO-CELL-AVAILABLE).

This sub state is not applicable to non-3GPP access.

[TS 24.501, clause 5.1.3.2.2]

In order to describe the detailed UE behaviour, the 5GS update (5U) status pertaining to a specific subscriber is defined.

If the UE is not SNPN enabled or the UE is not operating in SNPN access mode (see 3GPP TS 23.501 [8]), the 5GS update status is stored in a non-volatile memory in the USIM if the corresponding file is present in the USIM, else in the non-volatile memory in the ME, as described in annex C.

If the UE is operating in SNPN access mode, the 5GS update status for each SNPN whose SNPN identity is included in the "list of subscriber data" configured in the ME (see 3GPP TS 23.122 [5]) is stored in the non-volatile memory in the ME as described in annex C.

The 5GS update status value is changed only after the execution of a registration, network-initiated de-registration, 5GS based primary authentication and key agreement, service request or paging procedure.

5U1: UPDATED

The last registration attempt was successful.

5U2: NOT UPDATED

The last registration attempt failed procedurally, e.g. no response or reject message was received from the AMF.

5U3: ROAMING NOT ALLOWED

The last registration, service request, or registration for mobility or periodic registration update attempt was correctly performed, but the answer from the AMF was negative (because of roaming or subscription restrictions).

[TS 23.122, clause 3.1]

The tracking area is added to the list of "5GS forbidden tracking areas for roaming" which is stored in the MS. The MS shall then search for a suitable cell in the same PLMN but belonging to a tracking area which is not in the "5GS forbidden tracking areas for roaming" list.

9.1.5.1.12.3

Test description

9.1.5.1.12.3.1

Pre-test conditions

System Simulator:

- NGC cell C (MCC/MNC=MCC/MNC in USIM), NGC cell E (visited PLMN, mcc=002, mnc=101) and NGC cell I (visited PLMN, mcc=002, mnc=101, another TA) are configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in TS 38.508-1 [4], except replacing NRf3 with NRf2.

UE:

- The UE is last authenticated and registered on NGC Cell E.

Preamble:

- The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4] Table 4.4A.2-0.

9.1.5.1.12.3.2      Test procedure sequence

Table 9.1.5.1.12.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGCCell E as the "Serving cell". - Other NGC cells as "Non-suitable cell".	-	-	-	-
2	The UE is switched on.	-	-	-	-
3-14	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
15	The SS transmits a REGISTRATION REJECT message, 5GMM cause value = #13 " roaming not allowed in this tracking area ".	<--	REGISTRATION REJECT	-	-
16	The SS releases the RRC connection.	-	-	-	-
17	Check: Does the UE transmit the REGISTRATION REQUEST message on NGC Cell E in the next 30 seconds?	-->	REGISTRATION REQUEST	1	F

18	The SS reconfigures: - NGC cell I as the "Serving cell". - NGC cell E as a "Suitable Neighbour cell", - NGC cell C as "Non-suitable cell".	-	-	-	-
19	Check: Does the UE transmit the REGISTRATION REQUEST message on NGC Cell I?	-->	REGISTRATION REQUEST	1,3	P
20-26	Steps 5 to 11 from procedure in TS 38.508-1 [4] Table 4.5.2.2-2 are performed.	-	-	-	-
27	The SS transmits a REGISTRATION REJECT message, 5GMM cause value = #13 "roaming not allowed in this tracking area".	<--	REGISTRATION REJECT	-	-
28	The SS releases the RRC connection.	-	-	-	-
29	Check: Does the UE transmit the REGISTRATION REQUEST message in the next 30 seconds on NGC cell I or NGC cell E?	-->	REGISTRATION REQUEST	1,4	F
30	Switch off UE in State Deregistered as described in TS38.508-1 [4] subclause 4.9.6.4.	-	-	-	-
31	The SS reconfigures: - NGC cell E as the "Serving cell". - Other NGC cells as "Non-suitable cell".	-	-	-	-
32	Switch on UE.	-	-	-	-
33	Check: Does the UE transmit the REGISTRATION REQUEST message on NGC Cell E?	-->	REGISTRATION REQUEST	5	P
34-42	Steps 5 to 13 from procedure in TS 38.508-1 [4] Table 4.5.2.2-2 are performed.	-	-	-	-
43	The SS transmits a REGISTRATION REJECT message, 5GMM cause value = #13 "roaming not allowed in this tracking area".	<--	REGISTRATION REJECT	-	-
44	The SS releases the RRC connection.	-	-	-	-
45	The SS reconfigures: - NGC Cell E as the "Serving cell", - NGC Cell C as a "Suitable neighbour cell". - NGC Cell I as "Non-suitable cell".	-	-	-	-
46	Check: Does the UE transmit the REGISTRATION REQUEST message on NGC Cell C?	-->	REGISTRATION REQUEST	2	P
47-62a1	Steps 5–20a1 of Table 4.5.2.2-2 in TS38.508-1 [4] are performed.	-	-	-	-

9.1.5.1.12.3.3 Specific message contents

Table 9.1.5.1.12.3.3-1: REGISTRATION REJECT (step 15, step 27, step 43, Table 9.1.5.1.12.3.2-1)

Derivation path: TS 38.508-1 [4] table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'00001101'B	#13 "roaming not allowed in this tracking area"	

Table 9.1.5.1.12.3.3-2: REGISTRATION REQUEST (step 19, step 33, step 46, Table 9.1.5.1.12.3.2-1)

Derivation path: TS 38.508-1 [4] table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition

ngKSI			
NAS key set identifier	'111'B	no key is available	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	The valid SUCI	Only SUCI is available.	
Last visited registered TAI	Not present		

### 9.1.5.1.13 Initial registration / Rejected / No suitable cells in tracking area

#### 9.1.5.1.13.1 Test Purpose (TP)

(1)

```
with { the UE has sent initial REGISTRAION REQUEST message }  
  
ensure that {  
  
    when { the UE receives a REGISTRATION REJECT with cause #15 (No suitable cells in tracking area)}  
  
        then { the UE sets the 5GS update status to 5U3 ROAMING NOT ALLOWED and delete any 5G-GUTI, last  
visited registered TAI, TAI list and ngKSI }  
  
}
```

(2)

```
with { the UE is in 5GMM-DEREGISTERED.LIMITED-SERVICE state and the current TAI in the list of  
"forbidden tracking areas for roaming"}  
  
ensure that {  
  
    when { the UE re-selects a cell that belongs to the TAI where UE was rejected }  
  
        then { the UE does not attempt to perform registration}  
  
}
```

(3)

```
with { the UE has sent initial REGISTRAION REQUEST message }  
  
ensure that {  
  
    when { the UE receives a REGISTRATION REJECT with cause #15 (No suitable cells in tracking area)}  
  
        then { the UE searches for a suitable cell in another tracking area }  
  
}
```

#### 9.1.5.1.13.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.2.5.  
Unless otherwise stated these are Rel-15 requirements.



[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

    #3 (Illegal UE); or

    #6 (Illegal ME).

....

    #15    (No suitable cells in tracking area);

        The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter.

        The UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. The UE shall search for a suitable cell in another tracking area according to 3GPP TS 38.304 [15].

9.1.5.1.13.3

Test description

9.1.5.1.13.3.1

Pre-test conditions

System Simulator:

- 3 cells, NGC Cell A and NGC Cell B belonging to TAI-1, NGC Cell C is in TAI-2. All Cells in the same PLMN.

UE:

- None.

Preamble:

- The UE is switched OFF.
- NGC Cell A is set to “Serving Cell”.
- NGC Cell B is set to “Suitable neighbour cell”.
- NGC Cell C is set to “Non-Suitable cell”.

9.1.5.1.13.3.2

Test procedure sequence

Table 9.1.5.1.13.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The UE is switched on	-	-	-	-
2-9	Steps 2-9 of Table 4.5.2.2-2 in TS38.508-1 [4] are performed on NGC Cell A.	-	-	-	-
10	The SS transmits a REGISTRATION REJECT with cause #15 (No suitable cells in tracking area).	<--	REGISTRATION REJECT	-	-
11	The SS releases the RRC connection	-	-	-	-
12	Check: Does the UE transmit a REGISTRATION REQUEST message on NGC Cell A or NGC Cell B in the next 300 seconds?	-->	REGISTRATION REQUEST	1,2	F
13	The SS configures - NGC Cell C as "Serving Cell" - NGC Cell A as "Non-Suitable cell"	-	-	-	-
14	Check: Does the UE transmit a REGISTRATION REQUEST message on NGC Cell C?	-->	REGISTRATION REQUEST	3	P
15-29	Steps 5-19a1 of Table 4.5.2.2-2 in TS38.508-1 [4] are performed.	-	-	-	-

9.1.5.1.13.3.3 Specific message contents

Table 9.1.5.1.13.3.3-1: REGISTRATION REJECT (step 10 Table 9.1.5.1.13.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'00001111'B	Cause #15(No suitable cells in tracking area)	

Table 9.1.5.1.13.3.3-2: REGISTRATION REQUEST (step 14 Table 9.1.5.1.13.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	"No key is available"	
5GS mobile identity			
Type of identity	'001'B	5GS mobile identity is SUCI, 5G-GUTI has been deleted after receiving REGISTRATION REJECT at step 10.	
Last visited registered TAI	Not present	TAI has been deleted after receiving REGISTRATION REJECT at step 10.	

Table 9.1.5.1.13.3.3-3: Void

**9.1.5.1.14 Initial registration / Rejected / Congestion / Abnormal cases / T3346**

**9.1.5.1.14.1 Test Purpose (TP)**

**(1)**

```
with { The UE has sent initial REGISTRAION REQUEST message }  
  
ensure that {  
  
    when { UE receives a REGISTRATION REJECT with cause #22 (Congestion) with T3346 included and the  
    UE is NOT configured for High Priority Access in the selected PLMN }  
  
        then { UE does not start the Initial registration until T3346 expires }  
  
}
```

**(2)**

```
with { The UE has received initial REGISTRATION REJECT with T3346 included }  
  
ensure that {  
  
    when { upon expiry of T3346 }  
  
        then { UE starts the Initial registration procedure }  
  
}
```

**(3)**

**Void**

**(4)**

```
with { The UE has received initial REGISTRATION REJECT with T3346 included }  
  
ensure that {  
  
    when { the timer T3346 is running and the UE detects a cell better than serving cell on a PLMN  
    other than serving cells PLMN (S criterion for detected cell > S criterion for serving cell }  
  
        then { UE starts the Initial registration procedure on the detected cell }  
  
}
```

**(5)**

```
with { The UE has received initial REGISTRATION REJECT with T3346 included }  
  
ensure that {  
  
    when { the timer T3346 is running and the UE detects a cell better than serving cell on same PLMN  
    as serving cell (S criterion for detected cell > S criterion for serving cell)}}  
  
    then { UE starts the Initial registration procedure on the detected cell after T3346 expiry }  
  
}
```

### 9.1.5.1.14.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.2.2.3.3, 5.5.1.2.5 and 5.5.1.2.7. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

#3 (Illegal UE);

#6 (Illegal ME); or

....

#22 (Congestion).

If the T3346 value IE is present in the REGISTRATION REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall proceed as described below; otherwise it shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.2.7.

The UE shall abort the initial registration procedure, set the 5GS update status to 5U2 NOT UPDATED and enter state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION.

The UE shall stop timer T3346 if it is running.

If the REGISTRATION REJECT message is integrity protected, the UE shall start timer T3346 with the value provided in the T3346 value IE.

If the REGISTRATION REJECT message is not integrity protected, the UE shall start timer T3346 with a random value from the default range specified in 3GPP TS 24.008 [12].

The UE stays in the current serving cell and applies the normal cell reselection process. The initial registration procedure is started if still needed when timer T3346 expires or is stopped.

#27 (N1 mode not allowed).

The UE capable of S1 mode shall disable the N1 mode capability for both 3GPP access and non-3GPP access (see subclause 4.9).

Other values are considered as abnormal cases. The behaviour of the UE in those cases is specified in subclause 5.5.1.2.7.

[TS 24.501, clause 5.5.1.2.7]

The following abnormal cases can be identified:

a) Timer T3346 is running.

The UE shall not start the registration procedure for initial registration unless:

1) the UE is a UE configured for high priority access in selected PLMN; or

2) the UE needs to perform the registration procedure for initial registration for emergency services.

The UE stays in the current serving cell and applies the normal cell reselection process.

NOTE 1: It is considered an abnormal case if the UE needs to initiate a registration procedure for initial registration while timer T3346 is running independent on whether timer T3346 was started due to an abnormal case or a non-successful case.

[TS 24.501, clause 5.2.2.3.3]

The UE in 3GPP access:

- a) ...
- b) ...
- c) shall initiate an initial registration procedure when entering a new PLMN, if timer T3346 is running and the new PLMN is not equivalent to the PLMN where the UE started timer T3346, the PLMN identity of the new cell is not in the forbidden PLMN lists and the tracking area is not in one of the lists of 5GS forbidden tracking areas;

9.1.5.1.14.3

Test description

9.1.5.1.14.3.1

Pre-test conditions

System Simulator:

- NGC Cell A, NGC Cell B and NGC Cell E are configured according to Table 6.3.2.2-1 and Table 6.3.2.2-3 in TS 38.508-1 [4].
- System information combination NR-2 as defined in TS 38.508 [4] clause 4.4.3.1.2 is used.

UE:

None.

Preamble:

- The UE is in state Switched OFF (State 0-A) as per TS 38.508-1 [4] Table 4.4A.2-0.

9.1.5.1.14.3.2 Test procedure sequence

Table 9.1.5.1.14.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
0	The SS configures: - NGC Cell A as the "Non-Suitable "off" cell". - NGC Cell B as the "Non-Suitable "off" cell". - NGC Cell E as the "Serving cell".	-		-	
0A	The UE is Switched/Powerd ON	-	-	-	-
1-12	Steps 2-13 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-		-	-
13	SS transmits a REGISTRATION REJECT message with cause #22 (Congestion) and T3346 set to 3 minutes. (Note 1)	<--	REGISTRATION REJECT	-	-
14	The SS releases the RRC connection	-		-	-
15	Check : Does the UE transmit a RRCSetupRequest on NGC Cell E within T3346 minutes of Step 13? (Note 1)	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
16	Check : Does the UE transmit a REGISTRATION REQUEST on NGC Cell E	-->	5GMM: REGISTRATION REQUEST	2	P
17-25	Void				
26	SS transmits a REGISTRATION REJECT message with cause #22 (Congestion) and T3346 set to 3 minutes. (Note 1)	<--	REGISTRATION REJECT	-	-
27	The SS releases the RRC connection	-			
28	The SS configures: - NGC Cell A as the "Non-suitable cell". - NGC Cell B as the "Serving cell". - NGC Cell E as the "Non-suitable cell".				
29	Check : Does the UE transmit a REGISTRATION REQUEST on NGC Cell B within T3346 minutes of Step 26? (Note 1)	-->	5GMM: REGISTRATION REQUEST	4	P
30-31	Void	-	-	-	-
32-38	Steps 5-11 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.				
39	SS transmits a REGISTRATION REJECT message with cause #22 (Congestion) and T3346 set to 3 minutes. (Note 1)	<--	REGISTRATION REJECT	-	-
40	The SS releases the RRC connection	-		-	-
41	The SS configures: - NGC Cell A as the "Serving cell". - NGC Cell B as the "Non-suitable cell". - NGC Cell E as the "Non-suitable cell".				
42	Check : Does the UE transmit a RRCSetupRequest on NGC Cell A within T3346 minutes of Step 39? (Note 1)	-->	NR RRC: <i>RRCSetupRequest</i>	5	F
43	Check : Does the UE transmit a REGISTRATION REQUEST on NGC Cell A	-->	5GMM: REGISTRATION REQUEST	5	P
44-74b1	Void	-	-	-	-

75-90a1	Steps 5-20a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
Note 1: T3346 is set to 3 minutes.This is checked for 3 minutes less tolerance.					

9.1.5.1.14.3.3 Specific message contents

Table 9.1.5.1.14.3.3-1: REGISTRATION REJECT (steps 13, 26, 39 Table 9.1.5.1.14.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'00010110'B	Cause #22 (Congestion)	
T3346 Value	'00100011'B	3 minutes	

Table 9.1.5.1.14.3.3-2: Void

9.1.5.2 Mobility and periodic registration update

9.1.5.2.1 Mobility registration update / TAI list handling

9.1.5.2.1.1 Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED, and 5GMM-IDLE mode over 3GPP access }

ensure that {

    when { UE detects entering a tracking area which is not in the list of forbidden TAs and is not in the list of tracking areas that the UE previously registered in the AMF }

    then { UE initiates and successfully completes the registration procedure for mobility registration update }

    }

(2)

with { UE in state 5GMM-REGISTERED, and 5GMM-IDLE mode over 3GPP access }

ensure that {

    when { UE detects entering a tracking area which is not in the list of forbidden TAs and is in the list of tracking areas that the UE previously registered in the AMF }

    then { UE does not initiate the registration procedure for mobility registration update }

    }

(3)

with { UE in state 5GMM-REGISTERED, and 5GMM-IDLE mode over 3GPP access }

ensure that {

```
when { UE receives a new TAI list during a mobility registration update procedure }  
  
then { UE shall delete its old TAI list and store the received TAI list }  
  
}
```

**9.1.5.2.1.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.3.2, 5.5.1.3.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

- a) when the UE detects entering a tracking area that is not in the list of tracking areas that the UE previously registered in the AMF;
- ...

If case b) is the only reason for initiating the registration procedure for mobility and periodic registration update, the UE shall indicate "periodic registration updating" in the 5GS registration type IE; otherwise the UE shall indicate "mobility registration updating".

...

After sending the REGISTRATION REQUEST message to the AMF the UE shall start timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

The UE shall handle the 5GS mobility identity IE in the REGISTRATION REQUEST message as follows:

- ...
- b) for all other cases, if the UE holds a valid 5G-GUTI, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE.
- ...

When the registration procedure for mobility and periodic registration update is initiated in 5GMM-IDLE mode, the UE may include a PDU session status IE in the REGISTRATION REQUEST message, indicating which PDU sessions associated with the access type the REGISTRATION REQUEST message is sent over are active in the UE.

...



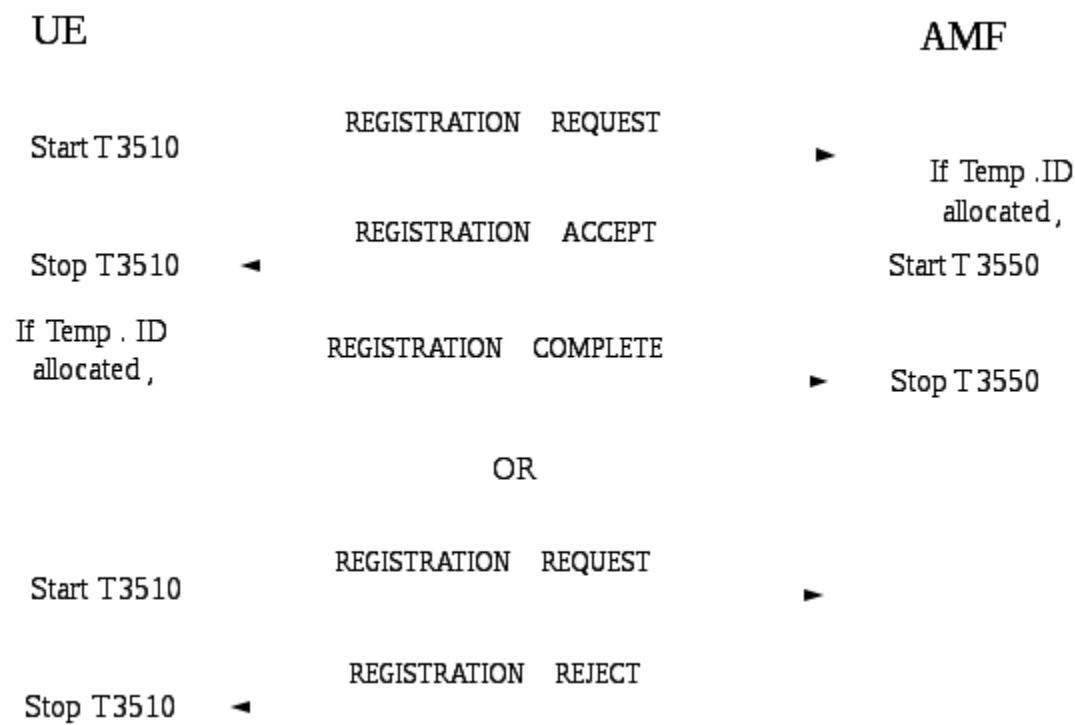


Figure 5.5.1.3.2.1: Registration procedure for mobility and periodic registration update

[TS 24.501, clause 5.5.1.3.4]

The AMF shall assign and include a TAI list as a registration area the UE is registered to in the REGISTRATION ACCEPT message. The UE, upon receiving a REGISTRATION ACCEPT message, shall delete its old TAI list and store the received TAI list. If the REGISTRATION REQUEST message was received over non-3GPP access, the AMF shall include only the N3GPP TAI in the TAI list.

...

Upon receipt of the REGISTRATION ACCEPT message, the UE shall reset the registration attempt counter, enter state 5GMM-REGISTERED and set the 5GS update status to 5U1 UPDATED.

...

If the REGISTRATION ACCEPT message contains a 5G-GUTI, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the received 5G-GUTI, stop timer T3519 if running, and delete any stored SUCI.

9.1.5.2.1.3 Test description

9.1.5.2.1.3.1 Pre-test conditions

System Simulator:

- 3 cells, NGC Cell A, and NGC Cell B and NGC Cell D belonging to the same PLMN and different TA in accordance with TS 38.508-1 [4] Table 6.3.2.2-1
- System information combination NR-2 as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2 is used in all cells when active.

UE:

None.

Preamble:

- The UE is in test state 1N-A as defined in 38.508-1 [4], subclause 4.4A on NGC Cell A.
- During the initial registration:
  - In the list of tracking areas provided by the AMF (IE 'TAI list') contains only the TAI of NGC Cell A.

9.1.5.2.1.3.2 Test procedure sequence

Table 9.1.5.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell B as "Serving cell" - NGC Cell A as "Non-Suitable cell".	-	-	-	-
2	Check: Does the UE perform on NGC Cell B the Registration procedure for mobility registration update by executing the Test procedure to check that UE is camped on a new cell belonging to a new TA as specified in TS 38.508-1 [4] subclause 4.9.5?  NOTE: During the procedure the SS assigns a TAI list containing the TAI of NGC Cell B and NGC Cell D.	-	-	1	-
3	The SS configures: - NGC Cell D as "Serving cell" - NGC Cell B as "Non-Suitable 'Off' cell".	-	-	-	-
4	Check: Does the UE send in the next 30 sec a request for RRC connection establishment.	-->	NR RRC: <i>RRCSetupRequest</i>	2	F
5	Check: Does the result of generic test procedure in TS 38.508-1 [4] subclause 4.9.4 indicate that the UE is in 5GC RRC_IDLE state on the NGC Cell D?	-	-	2	-
6	The SS configures: - NGC Cell A as "Serving cell" - NGC Cell D as "Non-Suitable cell".	-	-	-	-
7	Check: Does the UE perform on NGC Cell A the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5, ' <i>connected without release</i> '?	-	-	3	-

9.1.5.2.1.3.3 Specific message contents

Table 9.1.5.2.1.3.3-1: REGISTRATION REQUEST (step 2, Table 9.1.5.2.1.3.2-1; step 3, TS 38.508-1 [4] Table 4.9.5.2.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition

5GS registration type	'00xxx010'	mobility registration updating  x - not checked	
5GS mobile identity	Active 5G-GUTI assigned in the preamble		
5GMM capability	Any value		
Last visited registered TAI	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		
S1 UE network capability	If included then Any value	Shall be included if S1 mode indicated as supported in the IE '5GMM capability'	

Table 9.1.5.2.1.3.3-2: REGISTRATION ACCEPT (step 2, Table 9.1.5.2.1.3.2-1; step 4, TS 38.508-1 [4]  
Table 4.9.5.2.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

5GS registration result			
5GS registration result value	'001'	3GPP access	
SMS allowed	'0'	SMS over NAS not allowed	
5G-GUTI	A 5G-GUTI different to the one provided by the UE in the REGISTRATION REQUEST		
TAI list			
Type of list	"00"	list of TACs belonging to one PLMN, with non-consecutive TAC values	
MCC	The MCC of the PLMN to which the NGC Cell A, NGC Cell B and NGC Cell D belong to, see TS 38.508-1 [4] Table 6.3.2.2-1		
MNC	The MNC of the PLMN to which the NGC Cell A, NGC Cell B and NGC Cell D belong to, see TS 38.508-1 [4] Table 6.3.2.2-1		
TAC 1	The TAI of the NGC Cell B, see TS 38.508-1 [4] Table 6.3.2.2-1		
TAC 2	The TAI of the NGC Cell D, see TS 38.508-1 [4] Table 6.3.2.2-1		
PDU session status	If PDU session status was included in the REGISTRATION REQUEST, the indicated as active PDN sessions shall be confirmed as active		

Table 9.1.5.2.1.3.3-3: REGISTRATION REQUEST (step 7, Table 9.1.5.2.1.3.2-1; step 3, TS 38.508-1 [4] Table 4.9.5.2.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition

5GS registration type	'00xxx010'	mobility registration updating  x - not checked	
5GS mobile identity	Active 5G-GUTI assigned in Table 9.1.5.2.1.3.3-2: REGISTRATION ACCEPT		
5GMM capability	Any value		
Last visited registered TAI	The TAI of the NGC Cell D, see TS 38.508-1 [4] Table 6.3.2.2-1		
S1 UE network capability	If included then Any value	Shall be included if S1 mode indicated as supported in the IE '5GMM capability'	

Table 9.1.5.2.1.3.3-4: REGISTRATION ACCEPT (step 7, Table 9.1.5.2.1.3.2-1; step 4, TS 38.508-1 [4] Table 4.9.5.2.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

5GS registration result			
5GS registration result value	'001'	3GPP access	
SMS allowed	'0'	SMS over NAS not allowed	
5G-GUTI	Active 5G-GUTI assigned in the preamble		
TAI list			
Type of list	"00"	list of TACs belonging to one PLMN, with non-consecutive TAC values	
MCC	The MCC of the PLMN to which the NGC Cell A, NGC Cell B and NGC Cell D belong to, see TS 38.508-1 [4] Table 6.3.2.2-1		
MNC	The MNC of the PLMN to which the NGC Cell A, NGC Cell B and NGC Cell D belong to, see TS 38.508-1 [4] Table 6.3.2.2-1		
TAC 1	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		
PDU session status	If PDU session status was included in the REGISTRATION REQUEST, the indicated as active PDU sessions shall be confirmed as active		

9.1.5.2.2            Periodic registration update / Accepted

9.1.5.2.2.1            Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state and 5GMM-IDLE mode over 3GPP access }

ensure that {

    when { the periodic registration updating timer T3512 expires }

        then { the UE initiates the registration procedure for mobility and periodic registration update and indicates "periodic registration updating" in the 5GS registration type IE }

    }

(2)

with { the UE in 5GMM-REGISTERED-INITIATED state }

ensure that {

    when { the UE receives an REGISTRATION ACCEPT message included a new T3512 value IE }

```
    then { the UE uses the new value in T3512 value IE as periodic registration update timer (T3512)
  }

}
```

9.1.5.2.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.3.1, 5.5.1.3.2 and 5.5.1.3.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.1]

This procedure is used by a UE for both mobility and periodic registration update of 5GS services. This procedure, when used for periodic registration update of 5GS services, is performed only in 3GPP access.

This procedure used for periodic registration update of 5GS services is controlled in the UE by timer T3512. When timer T3512 expires, the registration procedure for mobility and periodic registration area updating is started. Start and reset of timer T3512 is described in subclause 10.2.

[TS 24.501, clause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

- a) when the UE detects entering a tracking area that is not in the list of tracking areas that the UE previously registered in the AMF;
- b) when the periodic registration updating timer T3512 expires;

...

If item b) is the only reason for initiating the registration procedure for mobility and periodic registration update, the UE shall indicate "periodic registration updating" in the 5GS registration type IE; otherwise the UE shall indicate "mobility registration updating".

...

[TS 24.501, clause 5.5.1.3.4]

...

If the REGISTRATION ACCEPT message included a T3512 value IE, the UE shall use the value in T3512 value IE as periodic registration update timer (T3512). If the T3512 value IE is not included, the UE shall use the value currently stored, e.g. from a prior REGISTRATION ACCEPT message.

...

9.1.5.2.2.3 Test description

9.1.5.2.2.3.1 Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 0N-B on NGC Cell A according to TS 38.508-1[4].

9.1.5.2.2.3.2 Test procedure sequence

Table 9.1.5.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on.	-	-	-	-
2-14	Steps 1-13 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
15	The SS transmits a REGISTRATION ACCEPT message.	<--	REGISTRATION ACCEPT	-	-
16-21	Steps 15-20 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-2 are performed.	-	-	-	-
22	The SS waits 3 minutes. (Expire of T3512)	-	-	-	-
23	Check: Does the UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE indicating "periodic registration updating"?	-->	REGISTRATION REQUEST	1	P
24	The SS transmits a REGISTRATION ACCEPT message including T3512 value IE.	<--	REGISTRATION ACCEPT	-	-
25	The SS releases the RRC connection.	-	-	-	-
26	The SS waits 1 minute. (Expire of T3512)	-	-	-	-
27	Check: Does the UE transmit a REGISTRATION REQUEST message?	-->	REGISTRATION REQUEST	2	P
28	The SS transmits a REGISTRATION ACCEPT message.	<--	REGISTRATION ACCEPT	-	-
29	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-

9.1.5.2.2.3.3 Specific message contents

Table 9.1.5.2.2.3.3-1: REGISTRATION ACCEPT (Step15 , Table 9.1.5.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-7			
Information Element	Value/Remark	Comment	Condition
T3512 value			
Unit	'101'B	value is incremented in multiples of 1 minute	
Timer value	'0 0011'B	3 minutes	

Table 9.1.5.2.2.3.3-2: REGISTRATION REQUEST (Step 23 & 27, Table 9.1.5.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type			
5GS registration type value	'011'B	periodic registration updating	



Table 9.1.5.2.2.3.3-3: REGISTRATION ACCEPT (Step 24, Table 9.1.5.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-7			
Information Element	Value/Remark	Comment	Condition
T3512 value			
Unit	'101'B	value is incremented in multiples of 1 minute	
Timer value	'0 0001'B	1 minute	

9.1.5.2.3

9.1.5.2.4            Mobility registration update / The lower layer requests NAS signalling connection recovery

9.1.5.2.4.1            Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED, and 5GMM-CONNECTED mode over 3GPP access and does not have signalling or user uplink data pending }

ensure that {

    when { UE receives an indication of "RRC Connection failure" from the lower layers }

    then { UE initiates and successfully completes the registration procedure for mobility registration update }

}

9.1.5.2.4.2            Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.3.2, 5.5.1.3.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

...

- f) when the UE receives an indication of "RRC Connection failure" from the lower layers and does not have signalling or user uplink data pending (i.e. when the lower layer requests NAS signalling connection recovery);

...

If case b) is the only reason for initiating the registration procedure for mobility and periodic registration update, the UE shall indicate "periodic registration updating" in the 5GS registration type IE; otherwise the UE shall indicate "mobility registration updating".

...

After sending the REGISTRATION REQUEST message to the AMF the UE shall start timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

The UE shall handle the 5GS mobility identity IE in the REGISTRATION REQUEST message as follows:

- ...
- b) for all other cases, if the UE holds a valid 5G-GUTI, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE.
- ...

When the registration procedure for mobility and periodic registration update is initiated in 5GMM-IDLE mode, the UE may include a PDU session status IE in the REGISTRATION REQUEST message, indicating which PDU sessions associated with the access type the REGISTRATION REQUEST message is sent over are active in the UE.

...

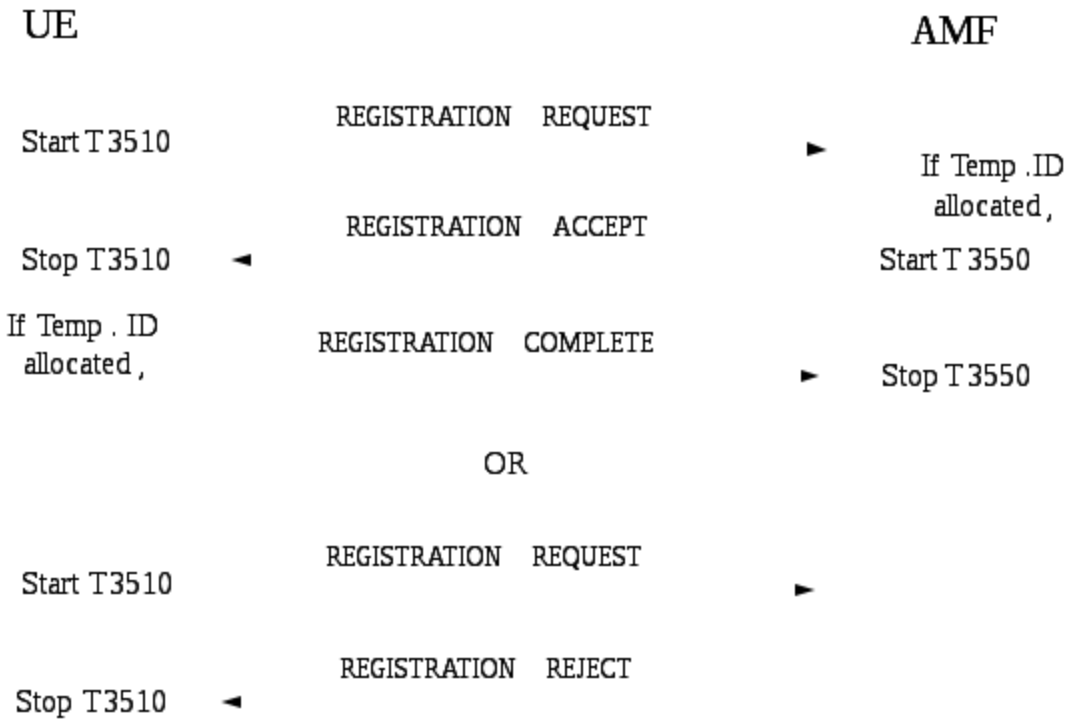


Figure 5.5.1.3.2.1: Registration procedure for mobility and periodic registration update

[TS 24.501, clause 5.5.1.3.4]

Upon receipt of the REGISTRATION ACCEPT message, the UE shall reset the registration attempt counter, enter state 5GMM-REGISTERED and set the 5GS update status to 5U1 UPDATED.

...

If the REGISTRATION ACCEPT message contains a 5G-GUTI, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the received 5G-GUTI, stop timer T3519 if running, and delete any stored SUCI.

9.1.5.2.4.3

Test description

9.1.5.2.4.3.1

Pre-test conditions

System Simulator:

- NGC Cell A, default system information in accordance with TS 38.508-1 [4] sub-clause 4.4.3.1.2.

UE:

- None.

Preamble:

- Cell configuration in accordance with TS 38.508-1 [4] Table 6.3.2.2-1:
  - NGC Cell A "Serving cell"
- The UE is in test state 3N-A as defined in TS 38.508-1 [4], subclause 4.4A.2 on NGC Cell A.

9.1.5.2.4.3.2

Test procedure sequence

Table 9.1.5.2.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell A as "Non-suitable "off" cell" in order to simulate radio link failure. (NOTE 1)	-	-	-	-
2	Wait for T=T310+T311+1.2 sec. (NOTE 1)	-	-	-	-
3	The SS configures: - NGC Cell A as "Serving cell".	-	-	-	-
4	Check: Does the UE perform on NGC Cell A the Registration procedure for mobility registration update by executing the Test procedure to check that UE is camped on a new cell belonging to a new TA as specified in TS 38.508-1 [4] subclause 4.9.5.2.2-1, 'connected without release'?	-	-	1	-
NOTE 1: Steps 1-2 simulate the RRC connection failure needed in order for the UE "NAS layer" to receive an indication of "RRC Connection failure" from the lower layers. This is based on requirements specified in TS 38.331 [12], subclauses 5.3.10.1, 5.3.10.3, 5.3.11. A 1s delay is added to allow for N310 consecutive "out-of-sync" indications and 0.2s is added for timer tolerance. Note that N310, T310, N311, T311 values are set in TS 38.508-1 [4], Table 4.6.3-150, <i>RLF-TimersAndConstants</i> .					

9.1.5.2.4.3.3

Specific message contents

Table 9.1.5.2.4.3.3-1: REGISTRATION REQUEST (step 4, Table 9.1.5.2.4.3.2-1; step 3, TS 38.508-1 [4] Table 4.9.5.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition

5GS registration type	'00xxx010'	mobility registration updating  x - not checked	
5GS mobile identity	Active 5G-GUTI assigned in the preamble		
5GMM capability	Any value		
Last visited registered TAI	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		
S1 UE network capability	If included then Any value	Shall be included if S1 mode indicated as supported in the IE '5GMM capability'	

Table 9.1.5.2.4.3.3-2: REGISTRATION ACCEPT (step 4, Table 9.1.5.2.4.3.2-1; step 4, TS 38.508-1 [4] Table 4.9.5.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition
5GS registration result			
5GS registration result value	'001'	3GPP access	
SMS allowed	'0'	SMS over NAS not allowed	
5G-GUTI	Active 5G-GUTI assigned in the preamble		
TAI list			
Type of list	"00"	list of TACs belonging to one PLMN, with non-consecutive TAC values	
MCC	The MCC of the PLMN to which the NGC Cell A, NGC Cell B and NGC Cell D belong to, see TS 38.508-1 [4] Table 6.3.2.2-1		
MNC	The MNC of the PLMN to which the NGC Cell A, NGC Cell B and NGC Cell D belong to, see TS 38.508-1 [4] Table 6.3.2.2-1		
TAC 1	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		
PDU session status	If PDU session status was included in the REGISTRATION REQUEST, the indicated as active PDN sessions shall be confirmed as active		

9.1.5.2.6

Void

9.1.5.2.7

Mobility and periodic registration update / Rejected / UE identity cannot be derived by the network

9.1.5.2.7.1

Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED on an NGC cell }

ensure that {

    when { UE initiates a Mobility and periodic registration procedure on an NGC cell and receives a REGISTRATION REJECT message including 5GMM cause value #9 (UE identity cannot be derived by the network) }

    then { UE deletes any 5G-GUTI, last visited registered TAI and ngKSI, enters the state 5GMM-DEREGISTERED 5U2 NOT UPDATED, and, subsequently automatically initiates the initial registration procedure }

}

9.1.5.2.7.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.5]

If the mobility and periodic registration update request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

    #9 (UE identity cannot be derived by the network).

        The UE shall set the 5GS update status to 5U2 NOT UPDATED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall enter the state 5GMM-DEREGISTERED.

        If the rejected request was not for initiating an emergency PDU session, the UE shall subsequently, automatically initiate the initial registration procedure.

9.1.5.2.7.3

Test description

9.1.5.2.7.3.1

Pre test conditions

System Simulator:

- 1 cell
- NGC Cell A as defined in TS 38.508-1 [4] Table 6.3.2.2-1. Default system information combination as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2.

UE:

None.

Preamble:

- The UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

9.1.5.2.7.2 Test procedure sequence

Table 9.1.5.2.7.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Wait for 25 seconds (expiry of T3512 periodic registration update timer, the value of 30 sec is provided during the initial registration in the Preamble).	-	-	-	-
2	The UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE indicating "periodic registration updating".	-->	REGISTRATION REQUEST	-	-
3	The SS transmits a REGISTRATION REJECT message including 5GMM cause value #9 (UE identity cannot be derived by the network).	<--	REGISTRATION REJECT	-	-
4	SS releases the RRC connection.	-	-	-	-
5	Check: Does the UE perform initial registration on NGC Cell A as specified in TS 38.508-1 [4], Table 4.5.2.2-2? The UE does not provide 5G-GUTI, last visited registered TAI or ngKSI.	-	-	1	P

9.1.5.2.7.3.3 Specific message contents

Table 9.1.5.2.7.3.3-1: REGISTRATION ACCEPT (Preamble; TS 38.508-1 [4] Table 4.5.2.2-2)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition
T3512 value			
Unit	'100'B	value is incremented in multiples of 30 seconds	
Timer value	'0 0001'B	30 seconds	

Table 9.1.5.2.7.3.3-2: REGISTRATION REQUEST (step 2, Table 9.1.5.2.7.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition

5GS registration type	'00xxx011'	periodic registration updating  x - not checked	
ngKSI	Active ngKSI assigned in the Preamble		
5GS mobile identity	Active 5G-GUTI assigned in the Preamble		
Last visited registered TAI	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		

Table 9.1.5.2.7.3.3-3: REGISTRATION REJECT (step 3, Table 9.1.5.2.7.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9.			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0000 1001'B	#9 - UE identity cannot be derived by the network	

Table 9.1.5.2.7.3.3-4: REGISTRATION REQUEST (step 5, Table 9.1.5.2.7.3.2-1; step 4, TS 38.508-1 [4] Table 4.5.2.2-2)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6, condition NON_CLEARTEXT_IE			
Information Element	Value/remark	Comment	Condition
5GS registration type	'00xxx001'	Initial registration  x - not checked	
ngKSI	'111'	no key is available	
5GS mobile identity	SUCI		
Non-current native NAS key set identifier	Not present		
Last visited registered TAI	Not present		
Additional GUTI	Not present		
NAS message container	Not included		

Table 9.1.5.2.7.3.3-5: SECURITY MODE COMPLETE (step 5, Table 9.1.5.2.7.3.2-1; step 9, TS 38.508-1 [4] Table 4.5.2.2-2)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-26, condition RINMR_INDICATED.
--

9.1.5.2.8 Mobility and periodic registration update / Rejected / Implicitly de-registered

9.1.5.2.8.1 Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED on an NGC cell }

ensure that {

when { UE initiates a Mobility and periodic registration procedure on an NGC cell and receives a REGISTRATION REJECT message including 5GMM cause value #10 (implicitly de-registered) }

```
    then { UE deletes any partial native 5G security context, enters the state 5GMM-  
DEREGISTERED.NORMAL-SERVICE, and, initiates a new registration procedure for initial registration }  
  
}
```

9.1.5.2.8.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.3.5.  
Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.5]

If the mobility and periodic registration update request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

#10 (implicitly de-registered).

The UE shall enter the state 5GMM-DEREGISTERED.NORMAL-SERVICE. The UE shall delete any mapped 5G security context or partial native 5G security context.

If the registration rejected request was not for initiating an emergency PDU session, the UE shall perform a new registration procedure for initial registration.

9.1.5.2.8.3 Test description

9.1.5.2.8.3.1 Pre test conditions

System Simulator:

- 2 cells, NGC Cell A, and NGC Cell B belonging to the same PLMN and different TA in accordance with TS 38.508-1 [4] Table 6.3.2.2-1. Default system information combination as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2 is used in all cells when active.

UE:

None.

Preamble:

- Cell configuration in accordance with TS 38.508-1 [4] Table 6.2.2.1-3:
  - NGC Cell A "Serving cell"
  - NGC Cell B "Non-suitable "Off" cell"
- The UE is in test state 1N-A as defined in 38.508-1 [4], subclause 4.4A.2 on NGC Cell A.
- During the initial registration:
  - In the list of tracking areas provided by the AMF (IE 'TAI list') contains only the TAI of NGC Cell A.



9.1.5.2.8.2 Test procedure sequence

Table 9.1.5.2.8.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell B as "Serving cell" - NGC Cell A as "Non-Suitable "Off" cell".	-	-	-	-
-	EXCEPTION: Unless otherwise stated the following messages are exchange on NGC Cell B.	-	-	-	-
2	The UE transmits an REGISTRATION REQUEST message indicating "mobility registration updating".	-->	5GMM: REGISTRATION REQUEST	-	-
3	The SS transmits an AUTHENTICATION REQUEST message to establish a new security context.	<--	5GMM: AUTHENTICATION REQUEST	-	-
4	The UE transmits an AUTHENTICATION RESPONSE message.	-->	5GMM: AUTHENTICATION RESPONSE	-	-
5	The SS transmits a REGISTRATION REJECT message including 5GMM cause value #10 (implicitly de-registered) prior to initiating a SMC to take into account the created during the steps 3-4 partial native 5G security context. (NOTE 1)	<--	REGISTRATION REJECT	-	-
6	SS releases the RRC connection.	-	-	-	-
7-9	Steps 1-3 from the generic procedure for UE initial Registration as specified in TS 38.508-1 [4], subclause 4.5.2, Table 4.5.2.2-2 (connectivity <i>NR</i> ) take place.	-	-	-	-
10	Check: Does the UE send a REGISTRATION REQUEST message, 5GS registration type IE set to Initial registration?	-->	5GMM: REGISTRATION REQUEST	1	P
11	The SS transmits a SECURITY MODE COMMAND message indicating the ngKSI of the partial native 5G security context assigned in the AUTHENTICATION REQUEST message sent in step 3.	<--	5GMM: SECURITY MODE COMMAND	-	-
12	The UE transmits a SECURITY MODE REJECT message.	-->	5GMM: SECURITY MODE REJECT	1	P
13-27a 1	Steps 5-19a1 from the generic procedure for UE initial Registration as specified in TS 38.508-1 [4], subclause 4.5.2, Table 4.5.2.2-2 (connectivity <i>NR</i> ) take place.	-	-	-	-
NOTE 1: This 5GMM cause is sent to the UE either if the network has implicitly de-registered the UE, e.g. after the implicit de-registration timer has expired, or if the 5GMM context data related to the subscription does not exist in the AMF e.g. because of a AMF restart, or because of a registration request for mobility or registration update is routed to a new AMF (see TS 24.301 [22], subclause A.1). The latter is an example when the serving AMF will not initiate a security mode control procedure after the primary authentication and key agreement procedure.					

9.1.5.2.8.3.3 Specific message contents

Table 9.1.5.2.8.3.3-1: REGISTRATION REQUEST (step 2, Table 9.1.5.2.8.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition

5GS registration type	'00xxx010'	mobility registration updating  x - not checked	
ngKSI	Active ngKSI assigned in the Preamble		
5GS mobile identity	Active 5G-GUTI assigned in the Preamble		
Last visited registered TAI	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		

Table 9.1.5.2.8.3.3-2: REGISTRATION REJECT (step 5, Table 9.1.5.2.8.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9.			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0000 1010'B	#10 - implicitly de-registered	

Table 9.1.5.2.8.3.3-3: REGISTRATION REQUEST (step 10, Table 9.1.5.2.8.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition
5GS registration type	'00xxx001'	Initial registration  x - not checked	
ngKSI	ngKSI assigned in the preamble	Native current security context is still present	
5GS mobile identity	Active 5G-GUTI assigned in the preamble		
Non-current native NAS key set identifier	Not present	partial native 5G security context has been deleted	
Last visited registered TAI	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		

Table 9.1.5.2.8.3.3-4: SECURITY MODE COMMAND (step 11, Table 9.1.5.2.8.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-25.			
Information Element	Value/remark	Comment	Condition
ngKSI	The ngKSI of the partial native 5G security context assigned in the AUTHENTICATION REQUEST message sent in step 3		

Table 9.1.5.2.8.3.3-5: SECURITY MODE REJECT (step 12, Table 9.1.5.2.8.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-25.			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 1000'	#24 - Security mode rejected, unspecified	

9.1.5.2.9            Mobility and periodic registration update / Abnormal / Change of cell into a new tracking area, collision with generic UE configuration update procedure

9.1.5.2.9.1            Test Purpose (TP)

(1)

Void

Editor’s Note: TP1 will be reinstated if a reliable test method to verify conformance requirements can be established.

(2)

with { UE initiates a Mobility and periodic registration procedure in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { UE receives a CONFIGURATION UPDATE COMMAND message before the registration procedure for mobility and periodic registration update has been completed }  
  
    then { UE shall ignore the message and proceed with the mobility and periodic registration update procedure }  
  
}

9.1.5.2.9.2            Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.3.7 and 5.4.4.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.7]

The following abnormal cases can be identified:

...

f) Change of cell into a new tracking area.

If a cell change into a new tracking area occurs before the registration procedure for mobility and periodic registration update is completed, the registration procedure for mobility and periodic registration update shall be aborted and re-initiated immediately. The UE shall set the 5GS update status to 5U2 NOT UPDATED.

...

h) Registration procedure for mobility and periodic registration update and generic UE configuration update procedure collision.

If the UE receives a CONFIGURATION UPDATE COMMAND message before the registration procedure for mobility and periodic registration update has been completed, UE shall behave as specified in subclause 5.4.4.5.

[TS 24.501, clause 5.4.4.5]

The following abnormal cases can be identified:

...

- d) Generic UE configuration update and registration procedure for mobility and periodic registration update collision

If the UE receives a CONFIGURATION UPDATE COMMAND message before the ongoing registration procedure for mobility and periodic registration update has been completed, and the Configuration update indication IE in the CONFIGURATION UDPATE COMMAND message indicates that the acknowledgement is requested, then the UE shall ignore the CONFIGURATION UPDATE COMMAND message and proceed with registration procedure for mobility and periodic update procedure. Otherwise the UE shall proceed with both the procedures.

9.1.5.2.9.3            Test description

9.1.5.2.9.3.1        Pre-test conditions

System Simulator:

- 2 NGC cells with system information combination NR-2 in accordance with TS 38.508-1[4] sub-clause 4.4.3.1.2.
- NGC cell A configured as "Serving cell" according to TS 38.508-1 [4] Table 6.2.2.1-3 for FR1 or Table 6.2.2.2-2 for FR2, HPLMN, TAI-1
- NGC cell B configured as "Non-Suitable cell" according to TS 38.508-1 [4] Table 6.2.2.1-3 for FR1 or Table 6.2.2.2-2 for FR2, HPLMN, TAI-2

UE:

None.

Preamble:

- The UE is in state 1N-A on NGC cell A according to TS 38.508-1 [4] Table 4.4A.2-1.

9.1.5.2.9.3.2            Test procedure sequence

Table 9.1.5.2.9.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

-	The following messages are to be observed on NGC cell B unless explicitly stated otherwise.	-	-	-	-
1	Change NGC cell A to "Non-Suitable "Off" cell". Change NGC cell B to "Serving cell".	-	-	-	-
2-4	Steps 1-3 in TS 38.508-1 [4] Table 4.9.5.2.2-1 are performed.	-	-	-	-
5	The SS transmits a CONFIGURATION UPDATE COMMAND message with the Configuration update indication IE indicating that the acknowledgement is requested.	<--	CONFIGURATION UPDATE COMMAND	-	-
6	Check: Does the UE transmit a CONFIGURATION UPDATE COMPLETE message within the expiry of T3555?	-->	CONFIGURATION UPDATE COMPLETE	2	F
7	Step 4 in TS 38.508-1 [4] Table 4.9.5.2.2-1 are performed with a new assigned 5G-GUTI in the REGISTRATION ACCEPT message.	-	-	-	-
8	Check: Does the UE transmit a REGISTRATION COMPLETE message?	-->	REGISTRATION COMPLETE	2	P
9	The SS releases the RRC connection.	-	-	-	-
10-15	Void	-	-	-	-

9.1.5.2.9.3.3 Specific message contents

Table 9.1.5.2.9.3.3-1: REGISTRATION REQUEST (steps 4 Table 9.1.5.2.9.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'010'B	Mobility registration updating	

Table 9.1.5.2.9.3.3-2: CONFIGURATION UPDATE COMMAND (step 5 Table 9.1.5.2.9.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	Not Present		
ACK	'1'B	acknowledgement requested	

Table 9.1.5.2.9.3.3-3: REGISTRATION ACCEPT (step 7 Table 9.1.5.2.9.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
T3512 value			
Timer value	'0 0010'B	2 minutes	
Unit	'101'B	value is incremented in multiples of 1 minute	

Table 9.1.5.2.9.3.3-4: Void)

Table 9.1.5.2.9.3.3-5: Void

9.1.6 De-registration

9.1.6.1 UE-initiated de-registration

9.1.6.1.1 UE-initiated de-registration / Switch off / Abnormal / De-registration and 5GMM common procedure collision

9.1.6.1.1.1 Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { the UE is switched off }  
  
        then { the UE shall send DEREGISTRATION REQUEST message with De-registration type IE indicated to "Switch off" }  
  
    }

(2)

with { the UE in 5GMM-DEREGISTERED-INITIATED state }  
  
ensure that {  
  
    when { the UE receives a DEREGISTRATION REQUEST message before the UE-initiated de-registration procedure has been completed }  
  
        then { the UE ignores the message and shall continue de-registration procedure }  
  
    }

(3)

with { the UE in 5GMM-DEREGISTERED-INITIATED state }  
  
ensure that {  
  
    when { the UE receives a 5GMM common procedure before the UE-initiated de-registration procedure has been completed }  
  
        then { the UE ignores the message and shall continue de-registration procedure }  
  
    }

**(4)**

**with** { the UE supports remove USIM without power down and in 5GMM-REGISTERED state }

**ensure that** {

**when** { the USIM is removed from the UE }

**then** { the UE shall send DEREGISTRATION REQUEST message with De-registration type IE indicated to "Switch off" }

    }

**9.1.6.1.1.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.2.1, 5.5.2.2.1 and 5.5.2.2.6. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.2.1]

The de-registration procedure is used:

- a) by the UE to de-register for 5GS services over 3GPP access when the UE is registered over 3GPP access;;
- b) by the UE to de-register for 5GS services over 3GPP access, non-3GPP access, or both when the UE is registered in the same PLMN over both accesses;
- c) by the network to inform the UE that it is deregistered for 5GS services over 3GPP access when the UE is registered over 3GPP access;
- d) by the network to inform the UE that it is deregistered for 5GS services over 3GPP access, non-3GPP access, or both when the UE is registered in the same PLMN over both accesses; and
- e) by the network to inform the UE to re-register to the network.

The de-registration procedure with appropriate de-registration type shall be invoked by the UE:

- a) if the UE is switched off; and
- b) as part of the eCall inactivity procedure defined in subclause 5.5.3.

The de-registration procedure with appropriate de-registration type shall be invoked by the network:

- a) if the network informs whether the UE should re-register to the network.

The de-registration procedure with appropriate access type shall be invoked by the UE:

- a) if the UE wants to de-register for 5GS services over 3GPP access when the UE is registered over 3GPP access;  
or
- b) the UE wants to de-register for 5GS services over 3GPP access, non-3GPP access, or both when the UE is registered in the same PLMN over both accesses.

If the de-registration procedure is triggered due to USIM removal, the UE shall indicate "switch off" in the de-registration type IE.

If the de-registration procedure is requested by the UDM for a UE that has an emergency PDU session, the AMF shall not send a DEREGISTRATION REQUEST message to the UE.

If the de-registration procedure for 5GS services is performed, the PDU sessions, if any, for this particular UE are released locally without peer-to-peer signalling between the UE and the network.

The UE is allowed to initiate the de-registration procedure even if the timer T3346 is running.

NOTE: When the UE has no PDU sessions over non-3GPP access, or the UE moves all the PDU sessions over a non-3GPP access to a 3GPP access, the UE and the AMF need not initiate de-registration over the non-3GPP access.

The AMF shall provide the UE with a non-3GPP de-registration timer.

[TS 24.501, clause 5.5.2.2.1]

The de-registration procedure is initiated by the UE by sending a DEREGISTRATION REQUEST message (see example in figure 5.5.2.2.1). The De-registration type IE included in the message indicates whether the de-registration procedure is due to a "switch off" or not. The access type included in the message indicates whether the de-registration procedure is:

- a) for 5GS services over 3GPP access when the UE is registered over 3GPP access only;
- b) for 5GS services over non-3GPP access when the UE is registered over non-3GPP access only; or
- c) for 5GS services over 3GPP access, non-3GPP access or both 3GPP access and non-3GPP access when the UE is registered in the same PLMN over both accesses.

If the UE has a valid 5G-GUTI, the UE shall populate the 5GS mobile identity IE with the valid 5G-GUTI. If the UE does not have a valid 5G-GUTI, the UE shall populate the 5GS mobile identity IE with its SUCI.

If the UE does not have a valid 5G-GUTI and it does not have a valid SUCI, then the UE shall populate the 5GS mobile identity IE with its PEI.

If the de-registration request is not due to switch off and the UE is in the state 5GMM-REGISTERED or 5GMM-REGISTERED-INITIATED, timer T3521 shall be started in the UE after the DEREGISTRATION REQUEST message has been sent. The UE shall enter the state 5GMM-DEREGISTERED-INITIATED.

If the UE is to be switched off, the UE shall try for a period of 5 seconds to send the DEREGISTRATION REQUEST message. During this period, the UE may be switched off as soon as the DEREGISTRATION REQUEST message has been sent.

[TS 24.501, clause 5.5.2.2.6]

...

- d) De-registration procedure collision.

De-registration containing de-registration type "switch off":

- If the UE receives a DEREGISTRATION REQUEST message before the UE-initiated de-registration procedure has been completed, this message shall be ignored and the UE-initiated de-registration procedure shall continue.

Otherwise:

- If the UE receives a DEREGISTRATION REQUEST message before the UE-initiated de-registration procedure has been completed, it shall treat the message as specified in subclause 5.5.2.3.2 with the following modification:
  - If the DEREGISTRATION REQUEST message received by the UE contains de-registration type "re-registration required", and the UE-initiated de-registration procedure is with de-registration type "normal de-registration", the UE need not initiate the registration procedure for initial registration.



- e) De-registration and 5GMM common procedure collision.
- De-registration containing de-registration type "switch off":
- If the UE receives a message used in a 5GMM common procedure before the de-registration procedure has been completed, this message shall be ignored and the de-registration procedure shall continue.
- Otherwise:
- If the UE receives a message used in a 5GMM common procedure before the de-registration procedure has been completed, both the 5GMM common procedure and the de-registration procedure shall continue.

9.1.6.1.1.3            Test description

9.1.6.1.1.3.1        Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 3N-A on NGC Cell A according to TS 38.508-1[4].

9.1.6.1.1.3.2        Test procedure sequence

Table 9.1.6.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

0	SS stops sending RLC acknowledgments.	-	-	-	-
1	Cause switch off	-	-	-	-
2	Check: Does the UE transmit a DEREGISTRATION REQUEST with the De-registration type IE indicating "switch off"?	-->	DEREGISTRATION REQUEST	1	P
3	The SS transmits a DEREGISTRATION REQUEST message.	<--	DEREGISTRATION REQUEST	-	-
3A	SS resumes sending RLC acknowledgments	-	-	-	-
4	Check: Does the UE transmit a DEREGISTRATION ACCEPT message within 6 seconds (T3522)?	-->	DEREGISTRATION ACCEPT	2	F
5	The SS releases the RRC connection.	-	-	-	-
6	Switch on the UE	-	-	-	-
7	The UE performs Registration procedure as specified in TS 38.508-1 [4] subclause 4.5.2 with ' <i>connected without release</i> '.	-	-	-	-
7A	SS stops sending RLC acknowledgments.	-	-	-	-
8	Cause switch off.	-	-	-	-
9	The UE transmits a DEREGISTRATION REQUEST with the De-registration type IE indicating "switch off".	-->	DEREGISTRATION REQUEST	-	-
10	The SS transmits an IDENTITY REQUEST message.	<--	IDENTITY REQUEST	-	-
10A	SS resumes sending RLC acknowledgments				
11	Check: Does the UE transmit an IDENTITY RESPONSE message within 6 seconds (T3570)?	-->	IDENTITY RESPONSE	3	F
12	The SS releases the RRC connection.	-	-	-	-
-	EXCEPTION: Steps 13a1 to 13a4 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that take place if the UE supports remove USIM without power down: pc_USIM_Removal = TRUE [29]	-	-	-	-
13a1	Switch on the UE	-	-	-	-
13a2	The UE performs Registration procedure as specified in TS 38.508-1 [4] subclause 4.5.2 with ' <i>connected without release</i> '.	-	-	-	-
13a3	Cause removal of USIM from the UE without powering down.	-	-	-	-
13a4	Check: Does the UE transmit a DEREGISTRATION REQUEST with the De-registration type IE indicating "switch off"?	-->	DEREGISTRATION REQUEST	4	P

9.1.6.1.1.3.3 Specific message contents

Table 9.1.6.1.1.3.3-1: DEREGISTRATION REQUEST (Steps 2, 9 and 13a4, Table 9.1.6.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-12			
Information Element	Value/Remark	Comment	Condition
De-registration type			
Switch off	'1'B		

9.1.6.1.2

UE-initiated de-registration / Normal de-registration / Abnormal /  
Transmission failure without TAI change from lower layers, De-registration  
and 5GMM common procedure collision, T3521 timeout

9.1.6.1.2.1

Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the UE initiates "normal de-registration" type deregistration from 5GS services over 3GPP access }

        then { the UE sends DEREGISTRATION REQUEST message with De-registration type IE indicated to "Normal de-registration" and starts timer T3521 }

    }

(2)

with { the UE in 5GMM-DEREGISTERED-INTIATED state }

ensure that {

    when { Transmission failure of DEREGISTRATION REQUEST message indication without TAI change from lower layers }

        then { the UE restarts the de-registration procedure }

    }

(3)

with { the UE in 5GMM-DEREGISTERED-INTIATED state }

ensure that {

    when { the UE receives a message used in a 5GMM common procedure before the de-registration procedure has been completed }

        then { both the 5GMM common procedure and the de-registration procedure shall continue }

    }

(4)

with { the UE in 5GMM-DEREGISTERED-INTIATED state }

ensure that {

    when { the first four expiries of the timer T3521 }

        then { the UE shall retransmit the DEREGISTRATION REQUEST message and shall reset and restart timer T3521 }

    }

(5)

```
with { the UE in 5GMM-DEREGISTERED-INTIATED state }  
  
ensure that {  
  
    when { On the fifth expiry of timer T3521 }  
  
        then { the detach procedure shall be aborted and the UE performs local detach }  
  
}
```

9.1.6.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clause 5.5.2.2.6 and TS 38.331 clause 5.7.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.2.2.6]

c) T3521 timeout.

On the first four expiries of the timer, the UE shall retransmit the DEREGISTRATION REQUEST message and shall reset and restart timer T3521. On the fifth expiry of timer T3521, the de-registration procedure shall be aborted and the UE proceeds as follows:

- 1) if the de-registration procedure was performed due to disabling of 5GS services, the UE shall enter the 5GMM-NULL state; or
- 2) if the de-registration type "normal de-registration" was requested for reasons other than disabling of 5GS services, the UE shall enter the 5GMM-DEREGISTERED state.

...

e) De-registration and 5GMM common procedure collision.

De-registration containing de-registration type "switch off":

- If the UE receives a message used in a 5GMM common procedure before the de-registration procedure has been completed, this message shall be ignored and the de-registration procedure shall continue.

Otherwise:

- If the UE receives a message used in a 5GMM common procedure before the de-registration procedure has been completed, both the 5GMM common procedure and the de-registration procedure shall continue.

h) Transmission failure of DEREGISTRATION REQUEST message indication without TAI change from lower layers.

The UE shall restart the de-registration procedure.

[TS 38.331, clause 5.7.2.4]

The UE shall:

- 1> if AS security is not started and radio link failure occurs before the successful delivery of ULInformationTransfer messages has been confirmed by lower layers; or

- 1> if mobility (i.e. handover, RRC connection re-establishment) occurs before the successful delivery of ULInformationTransfer messages has been confirmed by lower layers:
- 2> inform upper layers about the possible failure to deliver the information contained in the concerned ULInformationTransfer messages.

9.1.6.1.2.3

Test description

9.1.6.1.2.3.1

Pre-test conditions

System Simulator:

- NGC Cell A and NGC Cell B
- Both cells are configured as per table 6.3.2.2-1 TS 38.508-1 [4] with the below exceptions

Table 9.1.6.1.2.3.1–1: Cell configuration

NGC Cell	TAC	TAI
B	1	TAI-1

UE:

- None.

Preamble:

- the UE is in state 3N-A on NGC Cell A according to TS 38.508-1 [4].

9.1.6.1.2.3.2

Test procedure sequence

Table 9.1.6.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

0	The SS configures: - NGC Cell B as "Suitable neighbour cell".				
0A	SS transmits NR RRCReconfigurationmessage to configure specific maxRetxThreshold for NGC Cell A.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
0B	The UE transmits NR RRCReconfigurationComplete message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
1	The SS is configured not send RLC ACK for the message sent in step 2.	-	-	-	-
1A	AT or MMI command to cause UE to initiate de-registration.	-	-	-	-
-	The following messages are to be observed on Cell A unless explicitly stated otherwise.	-	-	-	-
2	Does the UE transmit a DEREGISTRATION REQUEST message with De-registration type IE indicating "Normal de-registration"? The UE starts timer T3521.	-->	5GMM: DEREGISTRATION REQUEST	1	P
3	Void	-	-	-	-
3A	The SS transmits an <i>RRCReconfiguration</i> message including reconfigurationWithSync with rach-ConfigDedicated to order the UE to perform intra-frequency handover to NGC Cell B.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
-	The following messages are to be observed on Cell B unless explicitly stated otherwise.	-	-	-	-
3B	The UE transmits an <i>RRCReconfigurationComplete</i> message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
4	Check: Does the UE restart the de-registration procedure by sending DEREGISTRATION REQUEST message? Timer T3521 is started.	-->	5GMM: DEREGISTRATION REQUEST	2	P
4A	The SS configures: - NGC Cell A as "Non-suitable "Off" cell".	-	-	-	-
5	With T3521 still running the SS shall send AUTHENTICATION REQUEST.	<--	5GMM: AUTHENTICATION REQUEST	-	-
6	Check: Does the UE transmit an AUTHENTICATION RESPONSE message?	-->	5GMM: AUTHENTICATION RESPONSE	3	P
7	SS responds with DEREGISTRATION ACCEPT message.	<--	5GMM: DEREGISTRATION ACCEPT	-	-
8	The SS releases the RRC connection.	-	-	-	-
9	AT or MMI command to cause UE to initiate registration.	-	-	-	-
10- 24a 4	Steps 2-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed to complete the registration.	-	-	-	-
25	Cause UE to initiate de-registration.	-	-	-	-
26	Check: Does the UE transmit a DEREGISTRATION REQUEST message with De-registration type IE indicating "Normal de- registration"? The UE starts timer T3521.	-->	5GMM: DEREGISTRATION REQUEST	1	P
27	SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
28	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message? Timer T3521 is re- started (1 <sup>st</sup> expiry).	-->	5GMM: DEREGISTRATION REQUEST	4	P
29	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
30	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message? Timer T3521 is re- started (2 <sup>nd</sup> expiry).	-->	5GMM: DEREGISTRATION REQUEST	4	P
31	The SS does not respond to the	-	-	-	-

	DEREGISTRATION REQUEST message.				
32	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message? Timer T3521 is re-started (3 <sup>rd</sup> expiry).	-->	5GMM: DEREGISTRATION REQUEST	4	P
33	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
34	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message? Timer T3521 is re-started (4 <sup>th</sup> expiry).	-->	5GMM: DEREGISTRATION REQUEST	4	P
35	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
36	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message in 10s? The UE shall abort the de-registration procedure and enter the 5GMM-DEREGISTERED (5 <sup>th</sup> expiry).	-->	5GMM: DEREGISTRATION REQUEST	5	F
Note: T3521 value is specified as 15s in TS 24.501 [22].					

9.1.6.1.2.3.3 Specific message contents

Table 9.1.6.1.2.3.3-0A: RRCReconfiguration (step 0A Table 9.1.6.1.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-13			
Information Element	Value/remark	Comment	Condition
RRCReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
nonCriticalExtension SEQUENCE {			
masterCellGroup	CellGroupConfig with condition SRB2_DRB1 configured in the preamble	OCTET STRING (CONTAINING CellGroupConfig)	
}			
}			
}			
}			

Table 9.1.6.1.2.3.3-0B: CellGroupConfig (Table 9.1.6.1.2.3.3-0A)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-19			
Information Element	Value/remark	Comment	Condition
CellGroupConfig ::= SEQUENCE {			
rlc-BearerToAddModList SEQUENCE (SIZE(1..maxLCH)) OF RLC-BearerConfig {	1 entry		SRB2_DRB1
RLC-Bearer-Config[1]	RLC-BearerConfig with condition SRB2		
}			
}			

Table 9.1.6.1.2.3.3-0C: RLC-BearerConfig (Table 9.1.6.1.2.3.3-0B)

Derivation Path: TS 38.508-1 [4], Table 4.6.3-148
---

Information Element	Value/remark	Comment	Condition
RLC-BearerConfig ::= SEQUENCE {			
rlc-Config	RLC-Config using condition AM		AM
}			

Table 9.1.6.1.2.3.3-0D: *RLC-Config* (Table 9.1.6.1.2.3.3-0C)

Derivation Path: TS 38.508-1 [4], Table 4.6.3-149			
Information Element	Value/remark	Comment	Condition
RLC-Config ::= CHOICE {			
am SEQUENCE {			AM
ul-AM-RLC SEQUENCE {			
maxRetxThreshold	t32		
}			
}			
}			

Table 9.1.6.1.2.3.3-1: DEREGISTRATION REQUEST (steps 2, 4, 26, 28, 30, 32 and 34, Table 9.1.6.1.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-12			
Information Element	Value/remark	Comment	Condition
De-registration type			
Switch off	'0'B	Normal de-registration	
Access type	'01'B	3GPP access	

Table 9.1.6.1.2.3.3-2: *RRCReconfiguration-HO* (step 3A Table 9.1.6.1.2.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.8.1-1A with condition RBConfig_KeyChange
---

9.1.6.1.3

UE-initiated de-registration / Abnormal / Change of cell into a new tracking area

9.1.6.1.3.1

Test Purpose (TP)

(1)

with { UE in 5GMM-DEREGISTERED-INITIATED state and de-registration request is not due to switch off }

ensure that {

  when { UE changes into a new tracking area that is not in the stored TAI list }

    then { *UE aborts the de-registration procedure and initiates a mobility registration procedure* }

}



(2)

```
with { UE in 5GMM-REGISTERED-INITIATED state for a mobility registration procedure due to change of
cell into a new tracking area list during UE-initiated de-registration procedure }

ensure that {

    when { UE receives REGISTRATION ACCEPT message }

        then { UE re-initiates the de-registration procedure after completing the mobility registration
procedure }

}
```

(3)

Void

9.1.6.1.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.2.2.6.  
Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 5.2.2.6]

The following abnormal cases can be identified:

...

- f) Change of cell into a new tracking area.

If a cell change into a new tracking area that is not in the stored TAI list occurs before the UE-initiated de-registration procedure is completed, the de-registration procedure shall be aborted and re-initiated after successfully performing a registration procedure for mobility or periodic update used for mobility (i.e. the 5GS registration type IE set to "mobility registration updating" in the REGISTRATION REQUEST message). If the de-registration procedure was initiated due to removal of the USIM or the UE is to be switched off, the UE shall abort the de-registration procedure and enter the state 5GMM-DEREGISTERED.

9.1.6.1.3.3 Test description

9.1.6.1.3.3.1 Pre-test conditions

System Simulator:

- NGC Cell A belongs to Home PLMN and TAI-1 and set as serving cell;
- NGC Cell B belongs to Home PLMN and TAI-2 and set as Non-Suitable cell.

UE:

- None;

Preamble:

- The UE is in state 3N-A on NGC cell A according to TS 38.508-1 [4].

9.1.6.1.3.3.2 Test procedure sequence

Table 9.1.6.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
-	The following messages are to be observed on NGC Cell A unless explicitly stated otherwise.	-	-	-	-
1	Cause UE to de-register for non Switch off reason using MMI or AT commands.	-	-	-	-
2	The UE transmits DEREGISTRATION REQUEST message. (The UE starts timer T3521)	-->	DEREGISTRATION REQUEST		
3	The SS does not respond to DEREGISTRATION REQUEST message.	-	-	-	-
4	The SS configures NGC Cell A as the "suitable cell" and NGC Cell B as the "Serving cell". Note: T3521 value is specified as 15s in TS 24.501 [22] and it is assumed that SS can configure cells within this time.	-	-	-	-
5	The SS transmits an <i>RRCReconfiguration</i> message on NGC Cell A to order the UE to perform intra-frequency handover to NGC Cell B.	-	-	-	-
6	The UE transmits a <i>RRCReconfigurationComplete</i> message on NGC Cell B to confirm the successful completion of the intra frequency handover.	-	-	-	-
-	The following messages are to be observed on NGC Cell B unless explicitly stated otherwise.	-	-	-	-
7	Check: Does the UE transmit a REGISTRATION REQUEST message with registration type value set to "mobility registration updating"	-->	REGISTRATION REQUEST	1	P
8 -9	Steps 4 to 5 of the generic procedure in TS 38.508-1 [4] subclause 4.9.5.2.2	-	-	-	-
10-22	Void				
23	Check: Does the UE transmit DEREGISTRATION REQUEST message?	-->	DEREGISTRATION REQUEST	2	P
24	The SS transmits DEREGISTRATION ACCEPT message.	<--	DEREGISTRATION ACCEPT	-	-
25	The SS transmits an <i>RRCRelease</i> message.	-	-	-	-
26	Check: Does the test result of the generic procedure in TS 38.508-1 [4] subclause 4.9.13 indicates that the UE doesn't responds to paging when paged with NG-5G-S-TMSI?	-	-	2	P
27-35	Void	-	-	-	-

9.1.6.1.3.3.3

Specific message contents

Table 9.1.6.1.3.3.3-1: DEREGISTRATION REQUEST (steps 2 and 23, Table 9.1.6.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-12			
Information Element	Value/remark	Comment	Condition
De-registration type			
Switch off	'0'B	Normal de-registration	
Re-registration required	'0'B	Spare bit	
Access type	'01'B	3GPP access	
5GS mobile identity	5G-GUTI	Same value as assigned in REGISTRATION ACCEPT	

Table 9.1.6.1.3.3.3-2: RRCReconfiguration-HO (step 5, Table 9.1.6.1.3.3.2-1)

Derivation Path: TS 38.508-1 [4],Table 4.8.1-1A with condition RBConfig_KeyChange
---

Table 9.1.6.1.3.3.3-3: Void

Table 9.1.6.1.3.3.3-4: Void

Table 9.1.6.1.3.3.3-5: Void

Table 9.1.6.1.3.3.3-6: Void)

Table 9.1.6.1.3.3.3-7: REGISTRATION REQUEST (step 7, Table 9.1.6.1.3.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'010'B		Mobility

Table 9.1.6.1.3.3.3-8: Void

9.1.6.1.4

Void

9.1.6.2

Network-initiated de-registration

9.1.6.2.1

Network-initiated de-registration / De-registration for 3GPP access / Re-registration required

9.1.6.2.1.1

Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state }

ensure that {

when { the SS sends a DEREGISTRATION REQUEST message indicates "re-registration required" and the de-registration request is for 3GPP access }

```
    then { the UE sends a DEREGISTRATION ACCEPT message to the network and releases the existing NAS
signalling connection, then initiates an initial registration and also re-establishes any previously
established PDU sessions. }

}
```

9.1.6.2.1.2 Conformance requirements

References: The conformance requirement covered in the present TC is specified in: 3GPP TS 24.501 clauses 5.5.2.3.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause5.5.2.3.2]

NOTE 1: When the de-registration type indicates "re-registration required", user interaction is necessary in some cases when the UE cannot re-establish the PDU session (s), if any, automatically.

...

Upon sending a DEREGISTRATION ACCEPT message, the UE shall delete the rejected NSSAI as specified in subclause 4.6.2.2.

If the de-registration type indicates "re-registration required", then the UE shall ignore the 5GMM cause IE if received.

If the de-registration type indicates "re-registration not required", the UE shall take the actions depending on the received 5GMM cause value:

#3 (Illegal UE);

...

As an implementation option, the UE may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

9.1.6.2.1.3 Test description

9.1.6.2.1.3.1 Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- the UE is in state 3N-A on NGC Cell A according to TS 38.508-1 [4].

9.1.6.2.1.3.2 Test procedure sequence

Table 9.1.6.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message/PDU/SDU		

1	The SS transmits a DEREGISTRATION REQUEST with indicates "re-registration required".	<--	DEREGISTRATION REQUEST	-	-
2	Check: Does the UE transmits a DEREGISTRATION ACCEPT message?	-->	DEREGISTRATION ACCEPT	1	P
3	The SS releases RRC connection.	-	-	-	-
4	The UE transmits an <i>RRCSetupRequest</i> message.	-->	NR RRC: <i>RRCSetupRequest</i>	-	-
5	The SS transmits an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>	-	-
6	Check: Does the UE transmits an <i>RRCSetupComplete</i> message and REGISTRATION REQUEST message with registration type set to "initial registration".	-->	NR RRC: <i>RRCSetupComplete</i> 5GMM: REGISTRATION REQUEST	1	P
7-23	Steps 5-20 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-

9.1.6.2.1.3.3            Specific message contents

Table 9.1.6.2.1.3.3-1: DEREGISTRATION REQUEST (step 1, Table 9.1.6.2.1.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-14			
Information Element	Value/Remark	Comment	Condition
DEREGISTRATION type			
Switch off	'0'B	Normal de-registration	
Re-registration required	'1'B	re-registration required	
Access type	'01'B	3GPP access	

9.1.6.2.2                Network-initiated de-registration / De-registration for 3GPP access / Re-registration not required

9.1.6.2.2.1             Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, ""re-registration not required"" and the de-registration request is for 3GPP access) }

    then { the UE deletes 5G-GUTI, TAI list, last visited registered TAI, list of equivalent PLMNs, ngKSI, sends a DEREGISTRATION ACCEPT message enter the state 5GMM-DEREGISTERED for 3GPP access }

    }

9.1.6.2.2.2             Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.5.2.3.2 and 5.5.2.3.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.2.3.2]

Upon receiving the DEREGISTRATION REQUEST message, if the DEREGISTRATION REQUEST message indicates "re-registration not required" and the de-registration request is for 3GPP access, the UE shall perform a local release of the PDU sessions over 3GPP access, if any. The UE shall send a DEREGISTRATION ACCEPT message to the network and enter the state 5GMM-DEREGISTERED for 3GPP access.

[TS 24.501, clause 5.5.2.3.4]

- b) DEREGISTRATION REQUEST, other 5GMM cause values than those treated in subclause 5.5.2.3.2, cases of 5GMM cause value#11, #22 and #72 that are considered as abnormal cases according to subclause 5.5.2.3.2 or no 5GMM cause IE is included, and the De-registration type IE indicates "re-registration not required".

The UE shall delete 5G-GUTI, TAI list, last visited registered TAI, list of equivalent PLMNs, ngKSI, shall set the 5GS update status to 5U2 NOT UPDATED and shall start timer T3502.

A UE not supporting S1 mode may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5]; otherwise the UE shall enter the state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION.

9.1.6.2.2.3            Test description

9.1.6.2.2.3.1        Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- the UE is previously registered on 5GC, and when on 5GC, the UE is last authenticated and registered on NGC cell A using default message contents according to TS 38.508-1 [4];

Preamble:

- The UE is in state 3N-A on NGC Cell A according to TS 38.508-1 [4].
- The T3502 in UE set to 2 minutes.

9.1.6.2.2.3.2        Test procedure sequence

Table 9.1.6.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		

1	SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, "re-registration not required" and the de-registration request is for 3GPP access	<--	5GMM: DEREGISTRATION REQUEST	-	-
2	Check: Does the UE transmit a DEREGISTRATION ACCEPT message? Note: Now UE should start timer T3502.	-->	5GMM: DEREGISTRATION ACCEPT	1	P
3	The SS releases the RRC connection.	-	-	-	-
4	The SS waits 2 mins for T3502 to expire.	-	-	-	-
5-22a1	Does the UE performs Steps 2-19a1 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4]?	-	-	1	P

9.1.6.2.2.3.3                      Specific message contents

Table 9.1.6.2.2.3.3-1: Message REGISTRATION ACCEPT (preamble)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
T3502 Value	2mins		
Timer value	'0 0010'B	The timer value is 2mins.	
Unit	'001'B		

Table 9.1.6.2.2.3.3-2: Message DEREGISTRATION REQUEST (step 1, Table 9.1.6.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-12			
Information Element	Value/remark	Comment	Condition
De-registration type			
Switch off	'0'B	Normal de-registration	
Re-registration required	'0'B	re-registration not required	
Access type	'01'B	3GPP access	
5GMM cause	Not Present		

Table 9.1.6.2.2.3.3-3: Message REGISTRATION REQUEST (step7, Table 9.1.6.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	no key is available (UE to network)	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	The valid SUCI		
Last visited registered TAI	Not present		

**9.1.7 Service request**

**9.1.7.1 Service request / IDLE mode uplink user data transport / Rejected /  
Restricted service area, Abnormal / T3517, T3525**

**9.1.7.1.1 Test Purpose (TP)**

**(1)**

**with** { the UE is in 5GMM-REGISTERED state and 5GMM-IDLE mode over 3GPP access }

**ensure that** {

**when** { UE has uplink user data pending }

**then** { the UE sends a SERVICE REQUEST message }

}

**(2)**

**with** { the UE sent a SERVICE REQUEST message }

**ensure that** {

**when** { UE receives a SERVICE REJECT message including an appropriate 5GMM cause value #28(Restricted service area) }

**then** { the UE performs the mobility registration update procedure }

}

**(3)**

**with** { the UE is in 5GMM-REGISTERED state and the UE has triggered the SERVICE REQUEST in 5GMM-IDLE mode }

**ensure that** {

**when** { T3517 expired}

**then** { the UE increases the service request attempt counter, aborts the procedure and release locally any resources allocated for the service request procedure }

}

**(4)**

**with** { the UE is in 5GMM-REGISTERED state and 5GMM-IDLE mode }

**ensure that** {

**when** { the service request attempt counter is equal to 5}

**then** { the UE starts timer T3525 and not attempts service request until expiry of T3525}

}



**9.1.7.1.2 Conformance requirements**

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clause 5.6.1.1, 5.6.1.5 and 5.6.1.7. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.6.1.1]

The purpose of the service request procedure is to change the 5GMM mode from 5GMM-IDLE to 5GMM-CONNECTED mode, and/or to request the establishment of user-plane resources for PDU sessions which are established without user-plane resources. In latter case, the 5GMM mode can be the 5GMM-IDLE mode or the 5GMM-CONNECTED mode if the UE requires to establish user-plane resources for PDU sessions.

...

The UE shall invoke the service request procedure when:

...

d) the UE, in 5GMM-IDLE mode over 3GPP access, has uplink user data pending;

...

If one of the above criteria to invoke the service request procedure is fulfilled, then the service request procedure shall only be initiated by the UE when the following conditions are fulfilled:

- its 5GS update status is 5U1 UPDATED, and the TAI of the current serving cell is included in the TAI list; and
- no 5GMM specific procedure is ongoing.

The UE shall not invoke the service request procedure when the UE is in the state 5GMM-SERVICE-REQUEST-INITIATED.

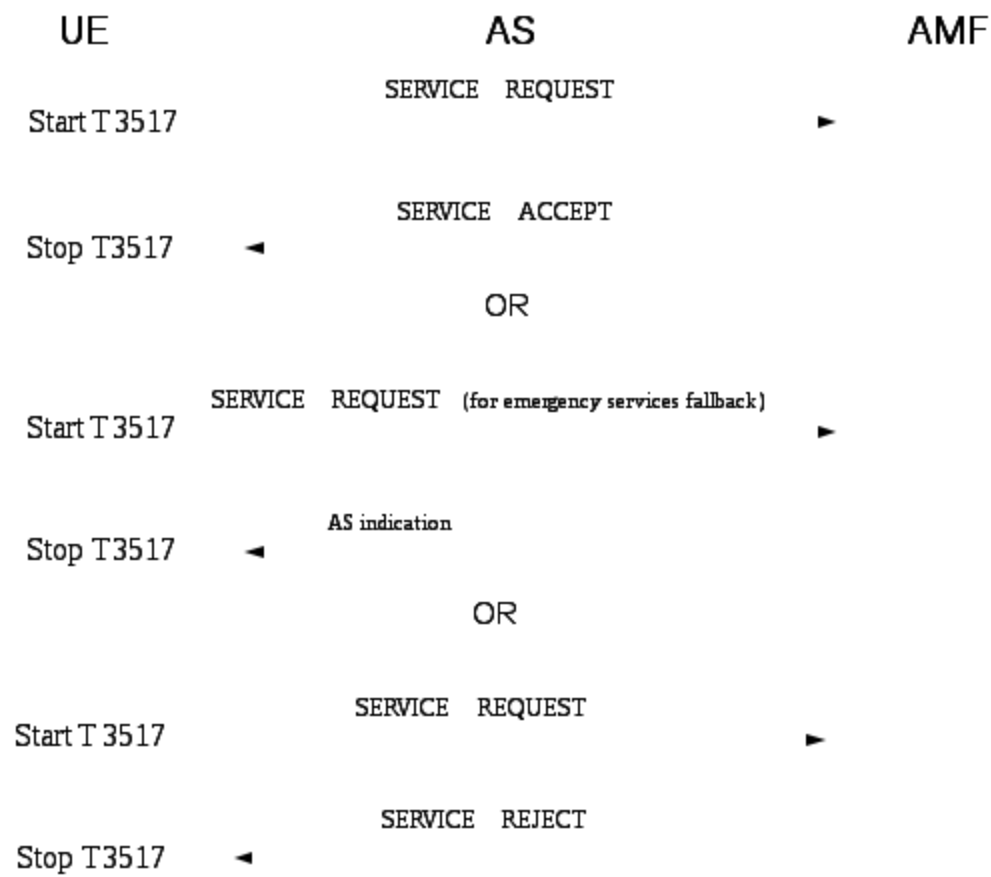


Figure 5.6.1.1.1: Service Request procedure

[TS 24.501, clause 5.6.1.5]

If the service request cannot be accepted, the network shall return a SERVICE REJECT message to the UE including an appropriate 5GMM cause value and stop timer T3517.

...

If the AMF determines that the UE is in a non-allowed area or is not in an allowed area as specified in subclause 5.3.5, then:

- a) if the service type IE in the SERVICE REQUEST message is set to "signalling" or "data", the AMF shall send a SERVICE REJECT message with the 5GMM cause value set to #28 "Restricted service area";

...

The UE shall take the following actions depending on the 5GMM cause value received in the SERVICE REJECT message.

#28 (Restricted service area).

The UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE, and perform the registration procedure for mobility and periodic registration update unless the service type IE in the SERVICE REQUEST message was set to "elevated signalling" (see subclause 5.3.5 and 5.5.1.3).

If the service type IE in the SERVICE REQUEST message was set to "elevated signalling", the UE shall not re-initiate service request procedure until the UE enters an allowed area or leaves a non-allowed area, except for emergency services, high priority access or responding to paging or notification.

[TS 24.501, clause 5.6.1.7]

The following abnormal cases can be identified:

- a) T3517 expired.

The UE shall enter the state 5GMM-REGISTERED.

If the UE triggered the service request procedure in 5GMM-IDLE mode and the service type of the SERVICE REQUEST message was not set to "emergency services fallback", then the 5GMM sublayer shall increment the service request attempt counter, abort the procedure and release locally any resources allocated for the service request procedure. The service request attempt counter shall not be incremented, if:

- 1) the service request procedure is initiated to establish an emergency PDU session;
- 2) the UE has an emergency PDU session established;
- 3) the UE is a UE configured for high priority access in selected PLMN; or
- 4) the service request is initiated in response to paging or notification from the network.

If the service request attempt counter is greater than or equal to 5, the UE shall start timer T3525. Additionally, if the service request was initiated for an MO MMTEL voice call, a notification that the service request was not accepted due to the UE having started timer T3525 shall be provided to the upper layers.

NOTE 1: This can result in the upper layers requesting implementation specific mechanisms, e.g. the MMTEL voice call being attempted to another IP-CAN, or establishment of a CS voice call (if supported and not already attempted in the CS domain).

The UE shall not attempt service request until expiry of timer T3525 unless:

- 1) the service request is initiated in response to paging or notification from the network;
- 2) the UE is a UE configured for high priority access in selected PLMN;
- 3) the service request is initiated to establish an emergency PDU session;
- 4) the UE has an emergency PDU session established; or
- 5) the UE is registered in a new PLMN.

NOTE 2: The NAS signalling connection can also be released if the UE deems that the network has failed the authentication check as specified in subclause 5.4.1.3.7.

**9.1.7.1.3                    Test description**

**9.1.7.1.3.1                Pre-test conditions**

**System Simulator:**

- NGC Cell A.

**UE:**

- None.

Preamble:

- The UE is in state 3N-A with UE test loop mode B active ( $T_{\text{delay\_modeB}} = 5$ ) according to TS 38.508-1 [4].

9.1.7.1.3.2 Test procedure sequence

Table 9.1.7.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell A as the "Serving cell".	-	-	-	-
2	The SS transmits one IP Packet to the UE.	<--	IP packet	-	-
3	The SS waits 1 second after the IP packet has been transmitted in step 2 and then transmits an RRCRelease message. (Note 1)	-	-	-	-
4	Check: Does UE transmit a SERVICE REQUEST message with Service type IE set to 'data'? (Note 2)	-->	SERVICE REQUEST	1	P
5	The SS transmits a SERVICE REJECT message with 5GMM cause = "Restricted service area".	<--	SERVICE REJECT	-	-
6-7	Void	-	-	-	-
7AA	The SS starts timer 5 sec. Note: An arbitraty chosen timer to avoid message crossing.	-	-	-	-
	EXCEPTION: Steps 7ABa1 to 7ABb3 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place if the UE is implemented in a certain way.	-	-	-	-
7ABa1	UE transmit REGISTRATION REQUEST message. NOTE: Allowed for Rel-15 UEs.	-->	REGISTRATION REQUEST	2	P
7ABa2	Stop timer 5 sec.	-	-	-	-
7ABb1	Timer 5 sec expires.	-	-	-	-
7ABb2	The SS releases the RRC connection.	-	-	-	-
7ABb3	Check: Does the UE transmit REGISTRATION REQUEST over a new signalling connection?	-->	REGISTRATION REQUEST	2	P
7AC-7B	Void				
8A	SS stops transmitting UL grant.	-	-	-	-
8B	The SS sends a REGISTRATION ACCEPT message	<--	REGISTRATION ACCEPT	-	-
8C	SS trasnmits one UL grant, for the UE to transmit the REGISTRATION COMPLETE message at step 8D.	-	-	-	-
8D	The UE sends a REGISTRATION COMPLETE.	-->	REGISTRATION COMPLETE	-	-
8E	The SS releases the RRC connection.	-	-	-	-
8F	The SS resumes UL grant transmission.	-	-	-	-
8G	The UE transmits a SERVICE REQUEST message over a new signalling connection.	-->	SERVICE REQUEST	-	-
8H	The SS does not respond to SERVICE REQUEST message. Note: The UE locally releases the signalling connection after T3517 expiry.	-	-	-	-
-	EXCEPTION: Steps 9 to 10 are repeated for 4 times.	-	-	-	-

9	Check: Does the UE transmits a SERVICE REQUEST message after T3517 expiry but before 60s over a new signalling connection?	-->	SERVICE REQUEST	3	P
10	The SS does not respond to SERVICE REQUEST message. Note: The UE locally releases the signalling connection after T3517 expiry.	-	-	-	-
11	Check: Does the UE transmits a SERVICE REQUEST message within 60 seconds (minimum value of T3525) over a new signalling connection?	-->	SERVICE REQUEST	3,4	F
12A	The SS starts timer 10 sec after Step 11 to see if UE performs the optional Steps listed below.	-	-	-	-
	EXCEPTION: Steps 12Aa1 to 12Aa6 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place if the UE is implemented in a certain way.	-	-	-	-
12Aa1	The UE transmits a SERVICE REQUEST message after T3525 expiry over a new signalling connection.	-->	SERVICE REQUEST	-	-
12Aa2-12Aa4	Steps 5 to 7 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are executed.	-	-	-	-
-	EXCEPTION: Steps 12Aa5 and 12Aa6 can occur in any order.	-	-	-	-
12Aa5	The UE transmits an RRCReconfigurationComplete message.	-->	NR RRC: RRCReconfigurationComplete	-	-
12Aa6	The UE loop backs the IP packet received in step 2 on the DRB associated with the default PDU session.	-	-	-	-
Note 1: The 1 second delay is used to secure that the UE have received and forwarded the IP Packet transmitted by the SS in step 2 to the UE test loop function before the RRCRelease message is sent by the SS in step 3.					
Note 2: Triggered when timer T_delay_modeB (IP PDU delay time) expires and pending uplink data exist in buffered PDCP SDUs according to TS 38.509 [6] clause 5.3.4.2.3 and TS 36.509 [8] clause 5.4.4.3.					

9.1.7.1.3.3 Specific message contents

Table 9.1.7.1.3.3-1: ACTIVATE TEST MODE (preamble)

Derivation Path: TS 38.508-1 [4]			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1 1 1 1		
Skip indicator	0 0 0 0		
Message type	1 0 0 0 0 1 0 0		
UE test loop mode	0 0 0 0 0 0 0 1	UE test loop mode B	UE TEST LOOP MODE B

Table 9.1.7.1.3.3-2: CLOSE UE TEST LOOP (preamble)

Derivation Path: TS 38.508-1 [4]			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	1 1 1 1		
Skip indicator	0 0 0 0		
Message type	1 0 0 0 0 0 0 0		
UE test loop mode	0 0 0 0 0 0 0 1	UE test loop mode B	UE TEST LOOP MODE B
UE test loop mode B LB setup			
IP PDU delay	0 0 0 0 0 1 0 1	5 seconds	

Table 9.1.7.1.3.3-3: SERVICE REQUEST (steps 4, 8G and 9, Table 9.1.7.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-16			
Information Element	Value/remark	Comment	Condition
Service type			
Service type value	'0001'B	data	
Uplink data status		Indicates data present for the PDU session with the DL IP packet looped back. The other bits are not checked.	Not allowed to be sent in cleartext and shall only be included in the complete SERVICE REQUEST message in the NAS message container IE.

Table 9.1.7.1.3.3-4: SERVICE REJECT (step 5, Table 9.1.7.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-18			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 1100'B	Restricted service area	

Table 9.1.7.1.3.3-5: REGISTRATION REQUEST (steps 7ABa1 and 7ABb3, Table 9.1.7.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type	'010'B	mobility registration updating	

9.1.7.2 Service request / CONNECTED mode user data transport / Abnormal / T3517

9.1.7.2.1 Test Purpose (TP)

(1)

with { the UE is in 5GMM-REGISTERED state and 5GMM-CONNECTED mode over 3GPP access }

ensure that {

when { the UE has user data pending due to no user-plane resources established for PDU session(s) used for user data transport }

then { the UE sends a SERVICE REQUEST message }

}

(2)

```
with { the UE sends a SERVICE REQUEST message in 5GMM-CONNECTED mode }  
  
ensure that {  
    when { T3517 expired }  
        then { the UE stays in 5GMM-CONNECTED mode }  
}
```

**9.1.7.2.2 Conformance requirements**

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.6.1.1, 5.6.1.2 and 5.6.1.7. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.6.1.1]

The purpose of the service request procedure is to change the 5GMM mode from 5GMM-IDLE to 5GMM-CONNECTED mode, and/or to request the establishment of user-plane resources for PDU sessions which are established without user-plane resources. In latter case, the 5GMM mode can be the 5GMM-IDLE mode or the 5GMM-CONNECTED mode if the UE requires to establish user-plane resources for PDU sessions.

NOTE 1: The lower layer indicates when the user-plane resources for PDU sessions are successfully established or released.

This procedure is used when:

- ...
- the UE has user data pending over 3GPP access and the UE is in 5GMM-IDLE or 5GMM-CONNECTED mode over 3GPP access;

The UE shall invoke the service request procedure when:

- ...
- e) the UE, in 5GMM-CONNECTED mode or in 5GMM-CONNECTED mode with RRC inactive indication, has user data pending due to no user-plane resources established for PDU session(s) used for user data transport;



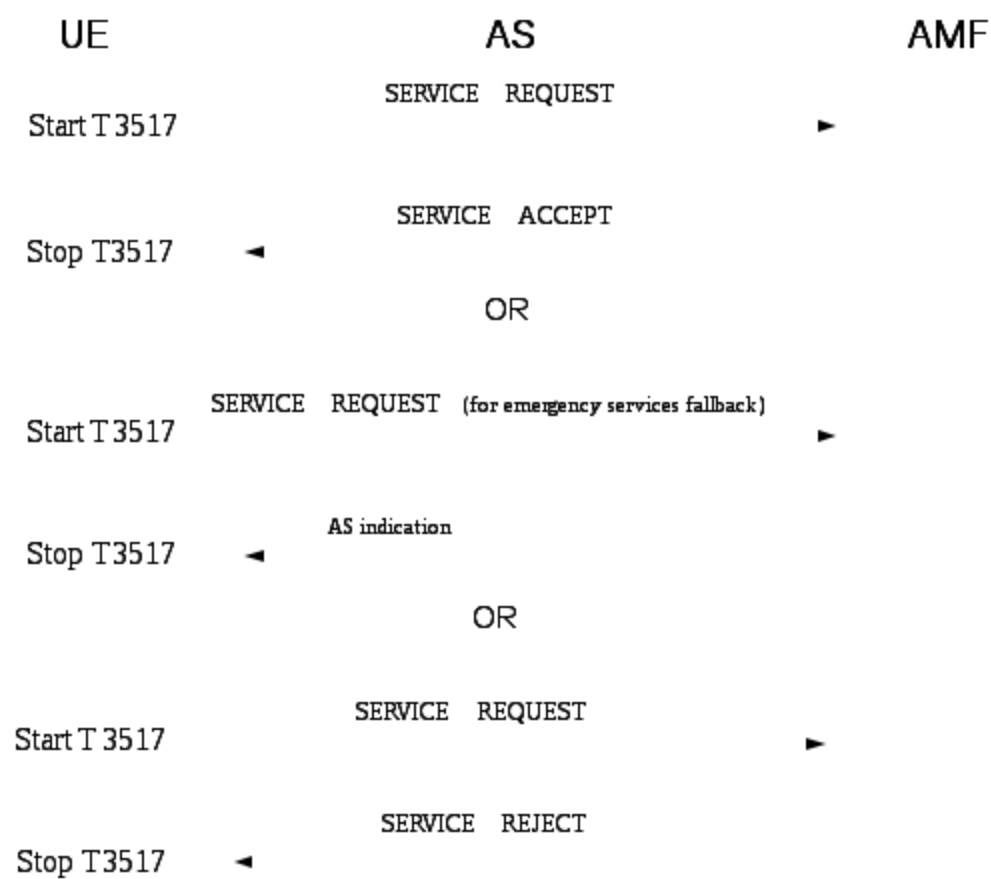


Figure 5.6.1.1.1: Service Request procedure

[TS 24.501, clause 5.6.1.2]

The UE initiates the service request procedure by sending a SERVICE REQUEST message to the AMF and starts timer T3517.

...

For cases d) and e) in subclause 5.6.1.1, the Uplink data status IE shall be included in the SERVICE REQUEST message to indicate the PDU session(s) the UE has pending user data to be sent. If the UE is not a UE configured for high priority access in selected PLMN:

- a) if there exists an emergency PDU session which is indicated in the Uplink data status IE the service type IE in the SERVICE REQUEST message shall be set to "emergency services"; or
- b) otherwise, the service type IE in the SERVICE REQUEST message shall be set to "data".

...

The Uplink data status IE may be included in the SERVICE REQUEST message to indicate which PDU session(s) associated with the access type the SERVICE REQUEST message is sent over have pending user data to be sent.

...

[TS 24.501, clause 5.6.1.7]

The following abnormal cases can be identified:

a) T3517 expired.

The UE shall enter the state 5GMM-REGISTERED.

If the UE triggered the service request procedure in 5GMM-IDLE mode and the service type of the SERVICE REQUEST message was not set to "emergency services fallback", then the 5GMM sublayer shall increment the service request attempt counter, abort the procedure and release locally any resources allocated for the service request procedure. The service request attempt counter shall not be incremented, if:

- 1) the service request procedure is initiated to establish an emergency PDU session;
- 2) the UE has an emergency PDU session established;
- 3) the UE is a UE configured for high priority access in selected PLMN; or
- 4) the service request is initiated in response to paging or notification from the network.

If the service request attempt counter is greater than or equal to 5, the UE shall start timer T3525. Additionally, if the service request was initiated for an MO MMTEL voice call, a notification that the service request was not accepted due to the UE having started timer T3525 shall be provided to the upper layers.

NOTE 1: This can result in the upper layers requesting implementation specific mechanisms, e.g. the MMTEL voice call being attempted to another IP-CAN, or establishment of a CS voice call (if supported and not already attempted in the CS domain).

The UE shall not attempt service request until expiry of timer T3525 unless:

- 1) the service request is initiated in response to paging or notification from the network;
- 2) the UE is a UE configured for high priority access in selected PLMN;
- 3) the service request is initiated to establish an emergency PDU session;
- 4) the UE has an emergency PDU session established; or
- 5) the UE is registered in a new PLMN.

NOTE 2: The NAS signalling connection can also be released if the UE deems that the network has failed the authentication check as specified in subclause 5.4.1.3.7.

...

9.1.7.2.3

Test description

9.1.7.2.3.1

Pre-test conditions

System Simulator:

- NGC Cell A

UE:

- None.

Preamble:

- the UE is in 5GS state 3N-A with at least one PDU session (with PDU session ID X where 1 <= X <= 15) active according to TS 38.508-1 [4], clause 4.4A.3 Table 4.4A.3-1. and using the message condition UE TEST LOOP MODE B prepared according to TS 38.508-1 [4]. DRB n is defined as default DRB for the PDU session X.

9.1.7.2.3.2 Test procedure sequence

Table 9.1.7.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		
1	Void.				
1A	Cause the UE to request establishment of PDU session Y to the DN. (Note 1)	-	-	-	-
1B	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message. (Note 2)	-->	NR 5GSM: PDU SESSION ESTABLISHMENT REQUEST	-	-
1C	SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message. (Note 2)	<--	NR 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
1D	The SS transmits a CLOSE UE TEST LOOP message with IP PDU delay set to 1 second.	<--	CLOSE UE TEST LOOP	-	-
1E	The UE transmits a CLOSE UE TEST LOOP COMPLETE message.	-->	CLOSE UE TEST LOOP COMPLETE	-	-
1F	The SS transmits one IP PDU on PDU session X.	<--	-	-	-
2	The SS transmits an <i>RRCReconfiguration</i> message to release User-plane resources for the PDU session X.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
3	The UE transmits an <i>RRCReconfigurationComplete</i> message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
4	Check: Does the UE transmit a <i>SERVICE REQUEST</i> message?	-->	NR 5GMM: <i>SERVICE REQUEST</i>	1	P
5	The SS does not respond to the <i>SERVICE REQUEST</i> message.	-	-	-	-
6	Wait for T3517 seconds (Note 3).	-	-	-	-
7	The UE transmit a <i>SERVICE REQUEST</i> message.	-->	NR 5GMM: <i>SERVICE REQUEST</i>	-	-
8	The SS sends an IDENTITY REQUEST message.	<--	NR 5GMM: IDENTITY REQUEST	-	-
9	Check: Does the UE transmit an IDENTITY RESPONSE message?.	-->	NR 5GMM: IDENTITY RESPONSE	2	P
10	The SS transmits an <i>RRCReconfiguration</i> message Piggybacked with <i>SERVICE ACCEPT</i> message to setup User-plane resources for the PDU session X.	<--	NR RRC: <i>RRCReconfiguration</i> NR 5GMM: <i>SERVICE ACCEPT</i>		
	EXCEPTION: Steps 11 and 13 can occur in any order	-	-	-	-
11	The UE transmits an <i>RRCReconfigurationComplete</i> message	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
12	Void.	-	-	-	-
13	The UE loop back the IP PDU on PDU session X.	-	-	-	-
Note 1: The request to establish a PDU session may be performed by MMI or AT command.					
Note 2: The reason to establish PDU session Y is to avoid that, after release user-plane resource for PDU session X in step 2-3, the UE can still be in 5GMM-CONNECTED mode as TP1 said. Otherwise, if the UE has only PDU session X, then according to TS 38.331 clause 5.3.1.1, UE has to release both SRB2 and DRB of PDU session X, then go to 5GMM-IDLE mode which violate TP1.					
Note 3: T3517 expires after 15 seconds.					

9.1.7.2.3.3 Specific message contents

Table 9.1.7.2.3.3-1: RRCReconfiguration (step 2, Table 9.1.7.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-13			
Information Element	Value/remark	Comment	Condition
RRCReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig	RadioBearerConfig		
masterCellGroup	MasterCellGroup		
}			
}			
}			

Table 9.1.7.2.3.3-2a: RadioBearerConfig (Table 9.1.7.2.3.3-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.3-132			
Information Element	Value/remark	Comment	Condition
RadioBearerConfig ::= SEQUENCE {			
drb-ToReleaseList SEQUENCE (SIZE (1..maxDRB))	1 entry		
OF DRB-Identity {			
DRB-Identity[1]	DRB configured in the preamble	entry 1	
}			
}			

Table 9.1.7.2.3.3-2b: MasterCellGroup (Table 9.1.7.2.3.3-1)

Derivation path: TS 38.508-1 [4], Table 4.6.3-19			
Information Element	Value/remark	Comment	Condition
CellGroupConfig ::= SEQUENCE {			
rlc-BearerToAddModList	Not present		
rlc-BearerToReleaseList SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity {	1 entry		
logicalChannelIdentity[1]	Logical channel identity corresponding to DRB configured in the preamble	entry 1	
}			
mac-CellGroupConfig	Not present		
physicalCellGroupConfig	Not present		
spCellConfig	Not present		
}			

Table 9.1.7.2.3.3-3: SERVICE REQUEST (step 4, 7, Table 9.1.7.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-16			
Information Element	Value/Remark	Comment	Condition

Service type	'0001'B	data	
Uplink data status			
PSI(X)	'1'B	PSI(X) is set to 1 indicates that uplink data are pending for the PDU session X activated in preamble.	

Table 9.1.7.2.3.3-4: IDENTITY REQUEST (step 8, Table 9.1.7.2.3.2-1)

Derivation Path: TS 38.508-1 [4] table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'0010'B	5G-GUTI	

Table 9.1.7.2.3.3-5: IDENTITY RESPONSE (step 9, Table 9.1.7.2.3.2-1)

Derivation Path: TS 38.508-1 [4] table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
Mobile identity	5G-GUTI		

Table 9.1.7.2.3.3-6: RRCReconfiguration (step 10, Table 9.1.7.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-13			
Information Element	Value/remark	Comment	Condition
RRCReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig	RadioBearerConfig with conditions DRB configured in the preamble		
nonCriticalExtension SEQUENCE {			
masterCellGroup	CellGroupConfig with condition DRB configured in the preamble	OCTET STRING (CONTAINING CellGroupConfig)	
}			
}			
}			
}			

Table 9.1.7.2.3.3-7: SERVICE ACCEPT (step 10, Table 9.1.7.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-17			
Information Element	Value/Remark	Comment	Condition

PDU session reactivation result			
PSI(X)	'0'B	PSI(X) is set to 0 indicates that establishment of user-plane resource of the PDU session X activated in preamble is successful.	

9.1.8 SMS over NAS

9.1.8.1 SMS over NAS / MO and MT SMS over NAS - Idle mode

9.1.8.1.1 Test Purpose (TP)

(1)

with { the UE in switched off state with valid USIM inserted }

ensure that {

    when { the UE requests initial registration for SMS over NAS }

        then { the UE shall send REGISTRATION REQUEST message with SMS requested bit of the 5GS update type IE "SMS over NAS supported" }

    }

(2)

with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the UE initiates a periodic registration update and the requirements to use SMS over NAS transport have not changed in the UE}

        then { the UE sets the SMS requested bit of the 5GS updatetype IE in the REGISTRATION REQUEST message to the same value as indicated by the UE in the last REGISTRATION REQUEST message }

    }

(3)

with { the UE in 5GMM\_Connected state with NR RRC\_IDLE mode and the UE has sent a SERVICE REQUEST message triggered by initiating MO SMS}

ensure that {

    when { UE receives a SERVICE ACCEPT message from SS }

        then { UE sends CP-DATA containing RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message }

    }

(4)

**with** { UE has sent CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message }

**ensure that** {

**when** { UE receives a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message }

**then** { UE sends a CP-ACK encapsulated in an Uplink NAS Transport message }

}

(5)

**with** { the UE in 5GMM-REGISTERED state with NR RRC\_IDLE mode, UE has received a paging request and UE has completed a SERVICE REQUEST procedure}

**ensure that** {

**when** { UE receives a CP-DATA containing an RP-DATA RPDU (SMS DELIVER TPDU) encapsulated in a Downlink NAS transport message }

**then** { UE sends a CP-ACK encapsulated in an Uplink NAS transport message followed by a CP-DATA containing an RP-ACK RPDU encapsulated in an Uplink NAS transport message}

}

9.1.8.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.2.2, 5.5.1.2.4, 5.5.1.3.2, 5.5.1.3.4, 9.11.3.6 and 9.11.3.9A. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 5.5.1.2.2]

The UE in state 5GMM-DEREGISTERED shall initiate the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF,

- a) when the UE performs initial registration for 5GS services;
- b) when the UE performs initial registration for emergency services;
- c) when the UE performs initial registration for SMS over NAS; and
- d) when the UE moves from GERAN to NG-RAN coverage or the UE moves from a UTRAN to NG-RAN coverage.

...

The UE initiates the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF, starting timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

...

If the UE requests the use of SMS over NAS, the UE shall include the 5GS update type IE in the REGISTRATION REQUEST message with the SMS requested bit set to “SMS over NAS supported”. When the 5GS update type IE is included in the REGISTRATION REQUEST for reasons other than requesting the use of SMS over NAS, and the UE

does not need to register for SMS over NAS, the UE shall set the SMS requested bit of the 5GS update type IE to “SMS over NAS not supported” in the REGISTRATION REQUEST message.

[TS 24.501 clause 5.5.1.2.4]

If the initial registration request is accepted by the network, the AMF shall send a REGISTRATION ACCEPT message to the UE.

...

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to “SMS over NAS supported”, and SMSF selection is successful, then the AMF shall send the REGISTRATION ACCEPT message after the SMSF has confirmed that the activation of the SMS service was successful. When sending the REGISTRATION ACCEPT message, the AMF shall:

- a) set the SMS allowed bit of the 5GS registration result IE to “SMS over NAS allowed” in the REGISTRATION ACCEPT message, if the UE has set the SMS requested bit of the 5GS registration type IE to “SMS over NAS supported” in the REGISTRATION REQUEST message and the network allows the use of SMS over NAS for the UE; and
- b) store the SMSF address and the value of the SMS allowed bit of the 5GS registration result IE in the UE 5GMM context and consider the UE available for SMS over NAS.

[TS 24.501 clause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

- l) when the UE needs to register for SMS over NAS, indicate a change in the requirements to use SMS over NAS, or de-register from SMS over NAS;

...

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic update by sending a REGISTRATION REQUEST message to the AMF when the UE needs to request the use of SMS over NAS transport or the current requirements to use SMS over NAS transport change in the UE. The UE shall set the SMS requested bit of the 5GS update type IE in the REGISTRATION REQUEST message as specified in subclause 5.5.1.2.2.

When initiating a registration procedure for mobility and periodic registration update and the UE needs to send the 5GS update type IE for a reason different than indicating a change in requirement to use SMS over NAS, the UE shall set the SMS requested bit of the 5GS update type IE in the REGISTRATION REQUEST message to the same value as indicated by the UE in the last REGISTRATION REQUEST message.

If the UE no longer requires the use of SMS over NAS, then the UE shall include the 5GS update type IE in the REGISTRATION REQUEST message with the SMS requested bit set to “SMS over NAS not supported”.

[TS 24.501 clause 5.5.1.3.4]

If the registration update request has been accepted by the network, the AMF shall send a REGISTRATION ACCEPT message to the UE.

...

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to “SMS over NAS not supported” and:

- a) the SMSF address is stored in the UE 5GMM context and:
  - 1) the UE is considered available for SMS over NAS; or



- 2) the UE is considered not available for SMS over NAS and the SMSF has confirmed that the activation of the SMS service is successful; or
- b) the SMSF address is not stored in the UE 5GMM context, the SMSF selection is successful and the SMSF has confirmed that the activation of the SMS service is successful;

then the AMF shall set the SMS allowed bit of the 5GS registration result IE in the REGISTRATION ACCEPT message as specified in subclause 5.5.1.2.4. If the UE 5GMM context does not contain an SMSF address or the UE is not considered available for SMS over NAS, then the AMF shall:

- a) store the SMSF address in the UE 5GMM context if not stored already; and
- b) store the value of the SMS allowed bit of the 5GS registration result IE in the UE 5GMM context and consider the UE available for SMS over NAS.

If SMSF selection in the AMF or SMS activation via the SMSF is not successful, or the AMF does not allow the use of SMS over NAS, then the AMF shall set the SMS allowed bit of the 5GS registration result IE to “SMS over NAS not allowed” in the REGISTRATION ACCEPT message.

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS not supported", then the AMF shall:

- a) mark the 5GMM context to indicate that the UE is not available for SMS over NAS; and

NOTE 2: The AMF can notify the SMSF that the UE is deregistered from SMS over NAS based on local configuration.

- b) set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS not supported" in the REGISTRATION ACCEPT message.

When the UE receives the REGISTRATION ACCEPT message, if the UE is also registered over another access to the same PLMN, the UE considers the value indicated by the SMS allowed bit of the 5GS registration result IE as applicable for both accesses over which the UE is registered.

[TS 24.501 clause 9.11.3.6]

The purpose of the 5GS registration result information element is to specify the result of a registration procedure.

The 5GS registration result information element is coded as shown in figure 9.11.3.6.1 and table 9.11.3.6.1.

The 5GS registration result is a type 4 information element with a length of 3 octets.

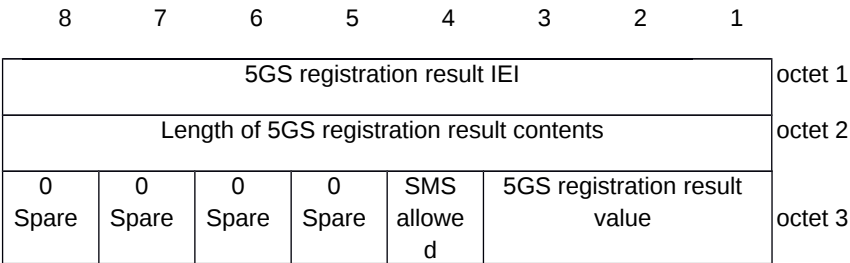


Figure 9.11.3.6.1: 5GS registration result information element

Table 9.11.3.6.1: 5GS registration result information element

5GS registration result value (octet 3, bits 1 to 3)		
Bits		
3	2	1

0	0	1	3GPP access
0	1	0	Non-3GPP access
0	1	1	3GPP access and non-3GPP access
1	1	1	reserved

All other values are unused and shall be treated as "3GPP access", if received by the UE.

SMS over NAS transport allowed (SMS allowed) (octet 3, bit 4)

Bit

4

0	SMS over NAS not allowed
1	SMS over NAS allowed

Bits 5 to 8 of octet 3 are spare and shall be coded as zero.

[TS 24.501 clause 9.11.3.9A]

The purpose of the 5GS update type IE is to allow the UE to provide additional information to the network when performing a registration procedure.

The 5GS update type information element is coded as shown in figure 9.11.3.9A.1 and table 9.11.3.9A.1.

The 5GS update type is a type 4 information element.

8	7	6	5	4	3	2	1	
5GS update type IEI								octet 1
Length of 5GS update type								octet 2
0	0	0	0	0	0	NG-RAN-RCU	SMS requested	octet 3
Spare	Spare	Spare	Spare	Spare	Spare			

Figure 9.11.3.9A.1: 5GS update type information element

Table 9.11.3.9A.1: 5GS update type information element

SMS over NAS transport requested (SMS requested) (octet 3, bit 1)	
Bit	
1	
0	SMS over NAS not supported
1	SMS over NAS supported
NG-RAN Radio Capability Update (NG-RAN-RCU) (octet 3, bit 2)	
Bits	
2	
0	NG-RAN radio capability update not needed
1	NG-RAN radio capability update needed
Bits 3 to 8 of octet 3 are spare and shall be coded as zero.	

9.1.8.1.3

Test description

9.1.8.1.3.1

Pre-test conditions

System Simulator:

NGC Cell A belongs to Home PLMN and TAI1;

UE:

The UE does not have any stored SMS message.

Preamble:

The UE is in state Switched OFF (state 0N-B) according to TS 38.508-1 [4].

9.1.8.1.3.2

Test procedure sequence

Table 9.1.8.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The UE is switched ON	-	-	-	-
2 - 4	UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS 38.508-1	-	-	-	-
5	Check: Does UE transmit a REGISTRATION REQUEST message including 5GS update type IE with SMS requested bit set to "SMS over NAS supported"?	-->	REGISTRATION REQUEST	1	P
6 - 14	Steps 5 to 13 of the generic procedure for NR RRC IDLE specified in TS 38.508-1 subclause 4.5.2, Table 4.5.2.2-2: NR RRC_IDLE are performed.	-	-	-	-
15	SS transmits REGISTRATION ACCEPT message including 5GS registration result with SMS allowed bit set to "SMS over NAS allowed" and T3512 value set to 3 minutes.	<--	REGISTRATION ACCEPT	-	-
16 - 21	Steps 15 to 20 of the generic procedure for NR RRC IDLE specified in TS 38.508-1 subclause 4.5.2, Table 4.5.2.2-2: NR RRC_IDLE are performed.	-	-	-	-
22 - 24	UE establishes RRC connection by executing steps 2-4 of Table 4.5.2.2-2 in TS38.508-1	-	-	-	-
25	Check: Does UE perform periodic Registration (Based on T3512 value indicated in the REGISTRATION ACCEPT message with timer starting in step-15) including 5GS update type IE with SMS requested bit set to "SMS over NAS supported"?	-->	REGISTRATION REQUEST	2	P
26 - 34	Void.	-	-	-	-
35	SS transmits REGISTRATION ACCEPT message including 5GS registration result with SMS allowed bit set to "SMS over NAS allowed" and T3512 value set to 3 minutes.	<--	REGISTRATION ACCEPT	-	-
35 A	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
36	The SS transmits an <i>RRCRelease</i> message	-	-	-	-
37	Sending of a 160 character MO SMS is initiated at the UE via MMI or AT command	-	-	-	-
38	The UE transmits a SERVICE REQUEST message.	-->	SERVICE REQUEST		
39 - 42	Steps 5 to 8 of the generic procedure for NR RRC CONNECTED specified in TS 38.508-1 subclause 4.5.4, Table 4.5.4.2-3: NR RRC_CONNECTED are performed.	-	-	-	-
43	The UE transmits a CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message.	-->	UPLINK NAS TRANSPORT	3	P
44	The SS transmits a CP-ACK encapsulated in a Downlink NAS Transport message.	<--	DOWNLINK NAS TRANSPORT	-	-
45	The SS transmits a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message	<--	DOWNLINK NAS TRANSPORT	-	-

46	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS Transport message?	-->	UPLINK NAS TRANSPORT	4	P
47	The SS transmits an <i>RRCRelease</i> message	-	-	-	-
48	The SS pages the UE using NG-5G-S-TMSI.	-	-	-	-
49	The UE transmits a SERVICE REQUEST message.	-->	SERVICE REQUEST	-	-
50-53	Steps 5 to 8 of the generic procedure for NR RRC CONNECTED specified in TS 38.508-1 subclause 4.5.4, Table 4.5.4.2-3: NR RRC_CONNECTED are performed.	-	-	-	-
54	The SS transmits a CP-DATA containing a RP-DATA RPDU (SMS DELIVER TPDU) encapsulated in a Downlink NAS transport message to the UE.	<--	DOWNLINK NAS TRANSPORT	-	-
55	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	5	P
56	Check: Does the UE transmit a CP-DATA containing a RP-ACK RPDU encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	5	P
57	The SS transmits a CP-ACK encapsulated in a Downlink NAS transport message to the UE.	<--	DOWNLINK NAS TRANSPORT	-	-

9.1.8.1.3.3 Specific message contents

Table 9.1.8.1.3.3-1: REGISTRATION REQUEST (step 5, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'001'B		INITIAL
5GS update type			
SMS requested	SMS over NAS supported		

Table 9.1.8.1.3.3-2: REGISTRATION ACCEPT (steps 15 and 35, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result			
SMS allowed	SMS over NAS allowed		
T3512 value			
Timer value	'00011'B		
Unit	'101'B		

Table 9.1.8.1.3.3-3: REGISTRATION REQUEST (step 25, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'011'B		PERIODIC
5GS update type			
SMS requested	SMS over NAS supported		

Table 9.1.8.1.3.3-3A: SERVICE REQUEST (step 38, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-16			
Information Element	Value/remark	Comment	Condition
Service type			
Service type value	'0000'B	signalling	

Table 9.1.8.1.3.3-4: UL NAS TRANSPORT (step 43, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU	

Table 9.1.8.1.3.3-5: DL NAS TRANSPORT (step 44, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.1.3.3-6: DL NAS TRANSPORT (step 45, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.1.8.1.3.3-7: UL NAS TRANSPORT (step 46, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.1.3.3-8: DL NAS TRANSPORT (step 54, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA	

Table 9.1.8.1.3.3-9: UL NAS TRANSPORT (step 55, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition

Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.1.3.3-10: UL NAS TRANSPORT (step 56, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK	

Table 9.1.8.1.3.3-11: DL NAS TRANSPORT (step 57, Table 9.1.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

9.1.8.2 SMS over NAS / Multiple MO and MT SMS over NAS - CONNECTED mode

9.1.8.2.1 Test Purpose (TP)

(1)

with { the UE is in 5GMM-REGISTERED state and 5GMM-CONNECTED mode over 3GPP access }

ensure that {

    when { a Multiple MO SMS is initiated at the UE }

        then { UE sends CP-DATA containing RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message }

    }

(2)

with { UE has sent CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message and has another MO SMS to send }

ensure that {

    when { UE receives a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message }

        then { UE does not send a final CP-ACK before it sends a CP-DATA containing the successive RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message }

    }

(3)

with { UE has sent CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message and has no further MO SMS to send }

```

ensure that {
  when { UE receives a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport
message }

    then { UE sends a CP-ACK encapsulated in an Uplink NAS transport message }

}

```

**(4)**

```

with { the UE is in 5GMM-REGISTERED state and 5GMM-CONNECTED mode over 3GPP access }

```

```

ensure that {
  when { UE receives a CP-DATA containing an RP-DATA RPDU (SMS DELIVER TPDU) encapsulated in a
Downlink NAS transport message, and subsequently a second CP-DATA containing an RP-DATA RPDU (SMS
DELIVER TPDU) encapsulated in a Downlink NAS transport message with different transaction identifier
}

    then { UE sends twice a CP-ACK encapsulated in an Uplink NAS transport message followed by a CP-
DATA containing an RP-ACK RPDU encapsulated in an Uplink NAS transport message}

}

```

**9.1.8.2.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clause 4.5.4.2, and TS 24.011 clause 9.11.3.9A. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 4.5.4.2]

If the lower layers indicate that the access attempt is allowed, the NAS shall take the following action depending on the event which triggered the access attempt:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication, an MO-MMTEL-video-call-started indication or an MO-SMSoIP-attempt-started indication, the NAS shall notify the upper layers that the access attempt is allowed;
- b) if the event which triggered the access attempt was a request from upper layers to send a mobile originated SMS over NAS, 5GMM shall initiate the NAS transport procedure as specified in subclause 5.4.5 to send the SMS in an UL NAS TRANSPORT message;

[TS 24.011 clause 5.4]

In the case of a SMS transfer via the PS domain, when the MS chooses to use the same PS signalling connection (in Iu mode and in S1 mode if packet-switched service is used); or in the case of a SMS transfer via the PS domain in A/Gb mode; or in the case of SMS transfer through the EPS, or in the case of SMS transfer in N1 mode, then:

- the MS shall transmit the CP-DATA for the successive RPDU and shall not transmit the final CP-ACK for the current SMS (i.e. the one that acknowledges the CP-DATA that carried the RP-ACK);
- the Transaction Identifier used for the successive RPDU shall be different to that used for the current RPDU; and
- the MS shall not transmit the CP-DATA for the successive RPDU before the final CP-DATA (i.e. the one that carried the RP-ACK) has been received.

NOTE: When an MS sends successive memory available notifications and/or mobile originated short messages on different RR connections (in A/Gb mode) or signalling connections (in Iu mode and S1 mode), the MS is strongly recommended to use different Transaction Identifiers for the old and new MM connections.



It is possible that the final CP-ACK of a short message transfer may not be received (e.g. due to transmission errors and/or hand overs).

For mobile terminated transfers, if the CP-ACK is lost, the reception of a CP-DATA with a different transaction identifier and carrying an RPDU shall be interpreted as the implicit reception of the awaited CP-ACK followed by the reception of the new CP-DATA message.

For mobile originated transfers, if the CP-ACK is lost or not sent by the MS, the following events shall be interpreted as the implicit reception of the awaited CP-ACK:

- in the case of a SMS transfer via the CS domain,, the reception of a CM SERVICE REQUEST followed by a CP-DATA with a different transaction identifier and carrying an RPDU; or
- in the case of a SMS transfer via the PS domain, the reception of a CP-DATA with a different transaction identifier and carrying an RPDU.

9.1.8.2.3

Test description

9.1.8.2.3.1

Pre-test conditions

System Simulator:

NGC Cell A belongs to Home PLMN and TAI1.

UE:

The UE does not have any stored SMS message.

Preamble:

The UE is in state 3N-A, registered with "SMS over NAS supported".

9.1.8.2.3.2

Test procedure sequence

Table 9.1.8.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	Sending of 3 MO SMS as multiple SMS is initiated at the UE via MMI or AT command	-	-	-	-
2	Check: Does the UE transmit a CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	1	P
3	The SS transmits a CP-ACK encapsulated in a Downlink NAS Transport message.	<--	DOWNLINK NAS TRANSPORT	-	-
4	The SS transmits a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message	<--	DOWNLINK NAS TRANSPORT	-	-
5	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS Transport message before the CP-DATA in step 6 is transmitted?	-->	UPLINK NAS TRANSPORT	2	F
6	Check: Does the UE transmit a CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	2	P
7	The SS transmits a CP-ACK encapsulated in a Downlink NAS Transport message.	<--	DOWNLINK NAS TRANSPORT	-	-
8	The SS transmits a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message	<--	DOWNLINK NAS TRANSPORT	-	-
9	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS Transport message before the CP-DATA in step 10 is transmitted?	-->	UPLINK NAS TRANSPORT	2	F
10	Check: Does the UE transmit a CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	2	P
11	The SS transmits a CP-ACK encapsulated in a Downlink NAS Transport message.	<--	DOWNLINK NAS TRANSPORT	-	-
12	The SS transmits a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message	<--	DOWNLINK NAS TRANSPORT	-	-
13	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS Transport message?	-->	UPLINK NAS TRANSPORT	3	P
14	The SS transmits a CP-DATA containing an RP-DATA RPDU (SMS DELIVER TPDU) encapsulated in a Downlink NAS transport message to the UE.	<--	DOWNLINK NAS TRANSPORT	-	-
15	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	4	P
16	Check: Does the UE transmit a CP-DATA containing an RP-ACK RPDU encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	4	P
17	The SS transmits a CP-DATA containing an RP-DATA RPDU (SMS DELIVER TPDU) encapsulated in a Downlink NAS transport message to the UE.	<--	DOWNLINK NAS TRANSPORT	-	-
18	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	4	P
19	Check: Does the UE transmit a CP-DATA containing an RP-ACK RPDU encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	4	P
20	The SS transmits a CP-ACK encapsulated in a	<--	DOWNLINK NAS TRANSPORT	-	-

	Downlink NAS transport message to the UE.				
--	---	--	--	--	--

9.1.8.2.3.3                      Specific message contents

Table 9.1.8.2.3.3-1: UL NAS TRANSPORT (step 2, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU TI used in steps 2, 3 and 4 shall be x1.	

Table 9.1.8.2.3.3-2: DL NAS TRANSPORT (step 3, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.2.3.3-3: DL NAS TRANSPORT (step 4, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.1.8.2.3.3-4: UL NAS TRANSPORT (step 6, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU TI used in steps 6, 7 and 8 shall be x2, with x1 <> x2 (see step 2).	

Table 9.1.8.2.3.3-5: DL NAS TRANSPORT (step 7, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.2.3.3-6: DL NAS TRANSPORT (step 8, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.1.8.2.3.3-7: UL NAS TRANSPORT (step 10, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU TI used in steps 10, 11, 12 and 13 shall be x3, with x3 <> x2 (see step 6).	

Table 9.1.8.2.3.3-8: DL NAS TRANSPORT (step 11, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.2.3.3-9: DL NAS TRANSPORT (step 12, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.1.8.2.3.3-10: UL NAS TRANSPORT (step 13, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.2.3.3-11: DL NAS TRANSPORT (step 14, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU TI used in steps 14, 15 and 16 is y1.	

Table 9.1.8.2.3.3-12: UL NAS TRANSPORT (step 15, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.2.3.3-13: UL NAS TRANSPORT (step 16, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.1.8.2.3.3-14: DL NAS TRANSPORT (step 17, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU TI used in steps 17, 18, 19 and 20 is y2, with y2 <> y1 (see step 14).	

Table 9.1.8.2.3.3-15: UL NAS TRANSPORT (step 18, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.1.8.2.3.3-16: UL NAS TRANSPORT (step 19, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.1.8.2.3.3-17: DL NAS TRANSPORT (step 20, Table 9.1.8.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

## 9.2 5GS Non-3GPP Access Mobility Management

### 9.2.1 Primary authentication and key agreement procedure

#### 9.2.1.1 EAP based primary authentication and key agreement

##### 9.2.1.1.1 Test Purpose (TP)

Same TP's as clause 9.1.1.1.1

##### 9.2.1.1.2 Conformance requirements

Same Conformance requirements as in clause 9.1.1.1.2.

##### 9.2.1.1.3 Test description

###### 9.2.1.1.3.1 Pre-test conditions

**System Simulator:**

- WLAN Cell 27

**UE:**

- None.

**Preamble:**

- The UE is in state Switched OFF (state 0W-B) according to TS 38.508-1 [4].

###### 9.2.1.1.3.2 Test procedure sequence

Table 9.2.1.1.3.2-1: Main behaviour

St		Procedure	Message Sequence		TP	Verdict
			U - S	Message		

1	Switch the UE on	-	-	-	-
2-4	The UE initiates establishment of an IPsec tunnel and registration procedure by executing steps 1-3 of Table 4.5.2.2-3 in TS 38.508-1 [4].	-	-	-	-
5	SS transmits an AUTHENTICATION REQUEST message with an EAP-Request/AKA'-Identity message.	<--	5GMM: AUTHENTICATION REQUEST		
6	Check: Does the UE respond with an AUTHENTICATION RESPONSE message, with an EAP-Response/AKA'-Identity message?	-->	5GMM: AUTHENTICATION RESPONSE	1	P
7	SS transmits an AUTHENTICATION REQUEST message with an EAP-Request/AKA'-challenge message which contains a not correct sequence number.	<--	5GMM: AUTHENTICATION REQUEST	-	-
8	Check: Does the UE respond with an AUTHENTICATION RESPONSE message, with an EAP-Response/AKA'-synchronization-failure?	-->	5GMM: AUTHENTICATION RESPONSE	2	P
9	SS transmits a correct AUTHENTICATION REQUEST message with an EAP-Request/AKA'-challenge message.	<--	5GMM: AUTHENTICATION REQUEST	-	-
10	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message, with an EAP-Request/AKA'-challenge message?	-->	5GMM: AUTHENTICATION RESPONSE	3	P
11	SS transmits an AUTHENTICATION RESULT message with an EAP-success message.	<--	5GMM: AUTHENTICATION RESULT	-	-
12-14	The registration procedure is performed by executing steps 6-8 of Table 4.5.2.2-3 in TS 38.508-1 [4].	-	-	-	-
15	Check: Does the UE transmits a REGISTRATION COMPLETE message?	-->	5GMM: REGISTRATION COMPLETE	4	P
16	The registration procedure is successfully completed by executing steps 10 of Table 4.5.2.2-3 in TS 38.508-1 [4].	-	-	-	-

9.2.1.1.3.3 Specific message contents

Table 9.2.1.1.3.3-1: Message AUTHENTICATION REQUEST (step 5, Table 9.2.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-request/AKA'-Identity	See Table 4.7.3.2-7 in TS 38.508-1 [4].	EAP-AKA

Table 9.2.1.1.3.3-2: Message AUTHENTICATION RESPONSE (step 6, Table 9.2.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-response/AKA'-Identity	See Table 4.7.3.2-8 in TS 38.508-1 [4].	EAP-AKA

Table 9.2.1.1.3.3-3: Message AUTHENTICATION REQUEST (step 7, Table 9.2.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-request/AKA'-challenge	The sequence number in AUTN is not correct	EAP-AKA

Table 9.2.1.1.3.3-4: Message AUTHENTICATION RESPONSE (step 8, Table 9.2.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-response/AKA'-synchronization-failure	See Table 4.7.3.2-5 in TS 38.508-1 [4].	EAP-AKA

Table 9.2.1.1.3.3-5: Message AUTHENTICATION RESPONSE (step 10, Table 9.2.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-2			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-Response/AKA'-Challenge	RES* equal to the XRES* calculated in the SS with the parameters provided/indicated in the AUTHENTICATION REQUEST	EAP-AKA

Table 9.2.1.1.3.3-6: Message AUTHENTICATION RESULT (step 11, Table 9.2.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-3			
Information Element	Value/Remark	Comment	Condition
EAP message	EAP-Success		EAP-AKA

9.2.1.2 5G AKA based primary authentication and key agreement

9.2.1.2.1 Test Purpose (TP)

Same Test purpose as in clause 9.1.1.4.1

9.2.1.2.2 Conformance requirements

Same Conformance requirements as in clause 9.1.1.4.2



9.2.1.2.3

Test description

9.2.1.2.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state Switched OFF (state 0W-B) according to TS 38.508-1 [4].

9.2.1.2.3.2

Test procedure sequence

Table 9.2.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Switch the UE on	-	-	-	-
2-4	The UE initiates establishment of an IPsec tunnel and registration procedure by executing steps 1-3 of Table 4.5.2.2-3 in TS 38.508-1 [4].	-	-	-	-
5	The SS transmits an AUTHENTICATION REQUEST message which contains an invalid MAC code.	<--	AUTHENTICATION REQUEST	-	-
6	Check: Does the UE respond with an AUTHENTICATION FAILURE message with 5GMM cause "MAC failure"?	-->	AUTHENTICATION FAILURE	1	P
7	SS transmits a correct AUTHENTICATION REQUEST message with RAND different to the one send in Step 5	<--	AUTHENTICATION REQUEST	-	-
8	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message with RES* that is equal to the XRES* calculated in the SS?	-->	AUTHENTICATION RESPONSE	4	P
9	SS transmits a NAS SECURITY MODE COMMAND message including the ngKSI of the new 5G NAS security context (as provided in step 7), to proceed with the registration procedure.	<--	SECURITY MODE COMMAND	-	-
10	Check: Does the UE respond with NAS SECURITY MODE COMPLETE message integrity protected and ciphered with the new 5G NAS security context identified by the ngKSI received in the SECURITY MODE COMMAND message in step 9.	-->	SECURITY MODE COMPLETE	5	P
11	Steps 10 of the generic procedure (TS 38.508-1 Table 4.5.2.2-3 [4]) are executed to successfully complete the registration procedure.	-	-	-	-
12	Switch off procedure in Ipsec_SA_Established specified in TS 38.508-1 [4] subclause 4.9.6.5 is performed.	-	-	-	-
13-16	Steps 1-4 above are repeated	-	-	-	-
17	SS transmits an AUTHENTICATION REQUEST message with "separation bit" in the AMF field is 0.	<--	AUTHENTICATION REQUEST	-	-
18	Check: Does the UE respond with an AUTHENTICATION FAILURE message, with 5GMM cause " Non-5G authentication unacceptable "?	-->	AUTHENTICATION FAILURE	2	P
19	SS transmits a correct AUTHENTICATION REQUEST message with RAND different to the one send in Step 22	<--	AUTHENTICATION REQUEST	-	-
20	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message with RES* that is equal to the XRES* calculated in the SS?	-->	AUTHENTICATION RESPONSE	4	P
21	Step 10 of the generic procedure (TS 38.508-1 Table 4.5.2.2-3 [4]) are executed to successfully complete the registration procedure.	-	-	-	-
22	Switch off procedure in Ipsec_SA_Established specified in TS 38.508-1 [4] subclause 4.9.6.5 is performed.	-	-	-	-
23-26	Steps 1-4 above are repeated	-	-	-	-
27	SS transmits AUTHENTICATION REQUEST	<--	AUTHENTICATION REQUEST	-	-

	message with the AMF field in the IE "Authentication parameter AUTN" set to "AMF <sub>RESYNCH</sub> " value to trigger SQN re-synchronisation procedure in test USIM				
28	Check: Does the UE respond with an AUTHENTICATION FAILURE message, with 5GMM cause "Synch failure" and Authentication failure parameter?	-->	AUTHENTICATION FAILURE	3	P
29	SS transmits a correct AUTHENTICATION REQUEST message with RAND different to the one send in Step 32.	<--	AUTHENTICATION REQUEST	-	-
30	Check: Does the UE respond with a correct AUTHENTICATION RESPONSE message with RES* that is equal to the XRES* calculated in the SS?	-->	AUTHENTICATION RESPONSE	4	P
31	Step 10 of the generic procedure (TS 38.508-1 Table 4.5.2.2-3 [4]) are executed to successfully complete the registration procedure.	-	-	-	-

9.2.1.2.3.3 Specific message contents

Table 9.2.1.2.3.3-1: AUTHENTICATION RESPONSE (step 8, step 20 and step 30 , Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-2			
Information Element	Value/remark	Comment	Condition
Authentication response parameter	RES* equal to the XRES* calculated in the SS with the parameters provided/indicated in the AUTHENTICATION REQUEST		

Table 9.2.1.2.3.3-2: AUTHENTICATION REQUEST (step 5, Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-1			
Information Element	Value/remark	Comment	Condition
Authentication parameter AUTN	Invalid MAC	SS shall calculate the correct MAC value as specified in TS 33.102 and use any different value, e.g. correct_MAC+5.	

Table 9.2.1.2.3.3-3: AUTHENTICATION FAILURE (step 6, Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-4			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 0100'B	MAC failure	

Table 9.2.1.2.3.3-4: AUTHENTICATION REQUEST (step 17, Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-1			
Information Element	Value/remark	Comment	Condition
Authentication parameter AUTN	"separation bit"=0	The "separation bit" in the AMF field of AUTN supplied by the core network is 0.	

Table 9.2.1.2.3.3-5: AUTHENTICATION FAILURE (step 18, Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-4			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 1010'B	Non-5G authentication unacceptable	

Table 9.2.1.2.3.3-6: AUTHENTICATION REQUEST (step 27, Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-1			
Information Element	Value/remark	Comment	Condition
Authentication parameter AUTN	AMF field set to "AMF <sub>RESYNCH</sub> ", AMF <sub>RESYNCH</sub> = '1111 1111 1111 1111'B	AMF <sub>RESYNCH</sub> see TS 34.108, 8.1.2.2	

Table 9.2.1.2.3.3-7: AUTHENTICATION FAILURE (step 28, Table 9.2.1.2.3.2-1)

Derivation path: TS 38.508, Table 4.7.1-4			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 0101'B	Synch failure	
Authentication failure parameter	AUTS	AUTS see TS 34.108, 8.1.2.2	

## 9.2.2 Security Mode Control

### 9.2.2.1 NAS security mode command

#### 9.2.2.1.1 Test Purpose (TP)

(1)

with { the UE is in 5GMM-REGISTERED-INITIATED state and the SS initiates the NAS security mode control procedure by sending a SECURITY MODE COMMAND message during initial registration procedure }

ensure that {

    when { the UE receives an integrity protected SECURITY MODE COMMAND message including not matching replayed security capabilities }

```
    then { the UE send a SECURITY MODE REJECT message and does not start applying the NAS security
in both UL and DL }

}
```

## (2)

```
with { the UE is in 5GMM-REGISTERED-INITIATED state and the SS initiates the NAS security mode
control procedure by sending a SECURITY MODE COMMAND message during initial registration procedure }
```

```
ensure that {
```

```
    when { the UE receives an integrity protected SECURITY MODE COMMAND message including IMEISV
request }
```

```
    then { the UE send an integrity protected and ciphered SECURITY MODE COMPLETE message including
IMEISV and starts applying the NAS Security in both UL and DL }
```

```
}
```

### 9.2.2.1.2 Conformance requirements

References: The conformance requirements covered in the present test case are specified in: TS 24.501, clauses 5.4.2.1, 5.4.2.3 and 5.4.2.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.4.2.1]

The purpose of the NAS security mode control procedure is to take a 5G NAS security context into use, and initialise and start NAS signalling security between the UE and the AMF with the corresponding 5G NAS keys and 5G NAS security algorithms.

Furthermore, the network may also initiate the security mode control procedure in the following cases:

- a)- in order to change the 5G NAS security algorithms for a current 5G NAS security context already in use;
- b) in order to change the value of uplink NAS COUNT used in the latest SECURITY MODE COMPLETE message as described in 3GPP TS 33.501 [24], subclause 6.9.4.4; and
- c) in order to provide the Selected EPS NAS security algorithms to the UE

For restrictions concerning the concurrent running of a security mode control procedure with other security related procedures in the AS or inside the core network see 3GPP TS 33.501 [24], subclause 6.9.5.

[TS 24.501, clause 5.4.2.3]

Upon receipt of the SECURITY MODE COMMAND message, the UE shall check whether the security mode command can be accepted or not. This is done by performing the integrity check of the message, and by checking that the received Replayed UE security capabilities IE has not been altered compared to the latest values that the UE sent to the network.

When the SECURITY MODE COMMAND message includes an EAP-success message the UE handles the EAP-success message and the ABBA as described in subclause 5.4.1.2.2.8.

If the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session and the SECURITY MODE COMMAND message is received with ngKSI value "000" and 5G-IA0 and 5G-EA0 as selected 5G NAS security algorithms, the UE shall locally derive and take in use 5G NAS security context. The UE shall delete existing current 5G NAS security context.

The UE shall ignore the Replayed S1 UE security capabilities IE if this IE is included in the SECURITY MODE COMMAND message.

The UE shall accept a SECURITY MODE COMMAND message indicating the "null integrity protection algorithm" 5G-EA0 as the selected 5G NAS integrity algorithm only if the message is received when the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session.

If the type of security context flag included in the SECURITY MODE COMMAND message is set to "native security context" and if the ngKSI matches a valid non-current native 5G NAS security context held in the UE while the UE has a mapped 5G NAS security context as the current 5G NAS security context, the UE shall take the non-current native 5G NAS security context into use which then becomes the current native 5G NAS security context and delete the mapped 5G NAS security context.

If the SECURITY MODE COMMAND message can be accepted, the UE shall take the 5G NAS security context indicated in the message into use. The UE shall in addition reset the uplink NAS COUNT counter if:

- a) the SECURITY MODE COMMAND message is received in order to take a 5G NAS security context into use created after a successful execution of the 5G AKA based primary authentication and key agreement procedure or the EAP based primary authentication and key agreement procedure; or
- b) the SECURITY MODE COMMAND message received includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE the ngKSI does not match the current 5G NAS security context, if it is a mapped 5G NAS security context.

If the SECURITY MODE COMMAND message can be accepted and a new 5G NAS security context is taken into use and SECURITY MODE COMMAND message does not indicate the "null integrity protection algorithm" 5G-IA0 as the selected NAS integrity algorithm, the UE shall:

- if the SECURITY MODE COMMAND message has been successfully integrity checked using an estimated downlink NAS COUNT equal to 0, then the UE shall set the downlink NAS COUNT of this new 5G NAS security context to 0;
- otherwise the UE shall set the downlink NAS COUNT of this new 5G NAS security context to the downlink NAS COUNT that has been used for the successful integrity checking of the SECURITY MODE COMMAND message.

If the SECURITY MODE COMMAND message includes the horizontal derivation parameter indicating " $K_{AMF}$  derivation is required", the UE shall derive a new  $K'_{AMF}$ , as specified in 3GPP TS 33.501 [24] for  $K_{AMF}$  to  $K'_{AMF}$  derivation in mobility, and set both uplink and downlink NAS COUNTs to zero. When the new 5G NAS security context is taken into use for current access and the UE is registered with the same PLMN over the 3GPP access and the non-3GPP access:

- a) the UE is in 5GMM-IDLE mode over the non-current access, the AMF and the UE shall activate the new 5G NAS security context over the non-current access as described in 3GPP TS 33.501 [24]. The AMF and the UE shall set the downlink NAS COUNT and uplink NAS COUNT to zero for the non-current access; or
- b) the UE is in 5GMM-CONNECTED mode over the non-current access, the AMF shall send the SECURITY MODE COMMAND message over the non-current access to activate the new 5G NAS security context that was activated over the current access as described in 3GPP TS 33.501 [24]. The AMF shall include the same ngKSI in the SECURITY MODE COMMAND message to identify the new 5G NAS security context.

If the SECURITY MODE COMMAND message includes the horizontal derivation parameter indicating " $K_{AMF}$  derivation is not required" or the Additional 5G security parameters IE is not included in the message, the UE is registered with the same PLMN over the 3GPP access and non-3GPP access, then after the completion of a security mode control procedure over the current access:

- a) the UE is in 5GMM-IDLE mode over the non-current access, the AMF and the UE shall activate the new 5G NAS security context for the non-current access. If a primary authentication and key agreement procedure was

completed before the security mode control procedure, the AMF and the UE shall set the downlink NAS COUNT and uplink NAS COUNT to zero for the non-current access, otherwise the downlink NAS COUNT and uplink NAS COUNT for the non-3GPP access are not changed; or

- b) the UE is in 5GMM-CONNECTED mode over the non-current access, the AMF shall send the SECURITY MODE COMMAND message over the non-current access to activate the new 5G NAS security context that was activated over the current access as described in 3GPP TS 33.501 [24]. The AMF shall include the same ngKSI in the SECURITY MODE COMMAND message to identify the new 5G NAS security context.

If the SECURITY MODE COMMAND message can be accepted, the UE shall send a SECURITY MODE COMPLETE message integrity protected with the selected 5GS integrity algorithm and the 5G NAS integrity key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  if the type of security context flag is set to "mapped security context" indicated by the ngKSI. When the SECURITY MODE COMMAND message includes the type of security context flag set to "mapped security context" in the NAS key set identifier IE, then the UE shall check whether the SECURITY MODE COMMAND message indicates the ngKSI of the current 5GS security context, if it is a mapped 5G NAS security context, in order not to re-generate the  $K'_{AMF}$ .

Furthermore, if the SECURITY MODE COMMAND message can be accepted, the UE shall cipher the SECURITY MODE COMPLETE message with the selected 5GS ciphering algorithm and the 5GS NAS ciphering key based on the  $K_{AMF}$  or mapped  $K'_{AMF}$  indicated by the ngKSI. The UE shall set the security header type of the message to "integrity protected and ciphered with new 5G NAS security context".

From this time onward the UE shall cipher and integrity protect all NAS signalling messages with the selected 5GS integrity and ciphering algorithms.

If the AMF indicated in the SECURITY MODE COMMAND message that the IMEISV is requested, the UE shall include its IMEISV in the SECURITY MODE COMPLETE message.

If, during an ongoing registration procedure or service request procedure, the SECURITY MODE COMMAND message includes the Additional 5G security information IE with the RINMR bit set to "Retransmission of the initial NAS message requested", the UE shall include the entire unciphered REGISTRATION REQUEST message or SERVICE REQUEST message, which the UE had previously included in the NAS message container IE of the initial NAS message (i.e. REGISTRATION REQUEST message or SERVICE REQUEST message, respectively), in the NAS message container IE of the SECURITY MODE COMPLETE message.

If, prior to receiving the SECURITY MODE COMMAND message, the UE without a valid 5GS NAS security context had sent a REGISTRATION REQUEST message the UE shall include the entire REGISTRATION REQUEST message in the NAS message container IE of the SECURITY MODE COMPLETE message as described in subclause 4.4.6.

If the UE operating in the single-registration mode receives the Selected EPS NAS security algorithms IE, the UE shall use the IE according to 3GPP TS 33.501 [24].

For a UE operating in single-registration mode with N26 interface supported in the network, after an inter-system change from S1 mode to N1 mode in 5GMM-CONNECTED mode, the UE shall set the value of the Selected EPS NAS security algorithms IE in the 5G NAS security context to the NAS security algorithms that were received from the source MME when the UE was in S1 mode.

[TS 24.501, clause 5.4.2.5]

If the security mode command cannot be accepted, the UE shall send a SECURITY MODE REJECT message. The SECURITY MODE REJECT message contains a 5GMM cause that typically indicates one of the following cause values:

- #23 UE security capabilities mismatch.
- #24 security mode rejected, unspecified.

If the UE detects that the received Replayed UE security capabilities IE has been altered compared to the latest values that the UE sent to the network, the UE shall set the cause value to #23 "UE security capabilities mismatch".

Upon receipt of the SECURITY MODE REJECT message, the AMF shall stop timer T3560. The AMF shall also abort the ongoing procedure that triggered the initiation of the NAS security mode control procedure.

Both the UE and the AMF shall apply the 5G NAS security context in use before the initiation of the security mode control procedure, if any, to protect the SECURITY MODE REJECT message and any other subsequent messages according to the rules in subclause 4.4.4 and 4.4.5.

9.2.2.1.3

Test description

9.2.2.1.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state Switched OFF (state 0-A) according to TS 38.508-1 [4].

9.2.2.1.3.2

Test procedure sequence

Table 9.2.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		



1	The UE is switched on.	-	-	-	-
1A	The UE transmits a REGISTRATION REQUEST message.	-->	REGISTRATION REQUEST	-	-
1B	The SS transmits an AUTHENTICATION REQUEST message including EAP-Request/AKA'-Challenge or 5G AKA Challenge.	<--	AUTHENTICATION REQUEST	-	-
1C	The UE transmits an AUTHENTICATION RESPONSE message including EAP-Response/AKA'-Challenge or 5G AKA Response.	-->	AUTHENTICATION RESPONSE	-	-
1D	The SS transmits a SECURITY MODE COMMAND message including EAP-Success if EAP-AKA' used.	<--	SECURITY MODE COMMAND	-	-
1E	The UE transmits a SECURITY MODE COMPLETE message.	-->	SECURITY MODE COMPLETE	-	-
1F	The SS transmits a REGISTRATION REJECT message with the cause value set to #6 Illegal ME as default.	<--	REGISTRATION REJECT	-	-
1G	The UE is switched off.	-	-	-	-
1H	The UE is switched on.	-	-	-	-
2-6	Steps 1-5 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-
7	The SS transmits a SECURITY MODE COMMAND message to activate NAS security. It is integrity protected and includes unmatched replayed security capabilities.	<--	SECURITY MODE COMMAND	-	-
8	Check: Does the UE transmit a SECURITY MODE REJECT message with cause'#23: UE security capabilities mismatch'?	-->	SECURITY MODE REJECT	1	P
9	The SS transmits an IDENTITY REQUEST message (Security not applied).	<--	IDENTITY REQUEST	-	-
10	Check: Does the UE transmit a non-security protected IDENTIY RESPONSE message?	-->	IDENTITY RESPONSE	1	P
11	The SS transmits a SECURITY MODE COMMAND message to activate NAS security. It is integrity protected and includes IMEISV.	<--	SECURITY MODE COMMAND	-	-
12	Check: Does the UE transmit a SECURITY MODE COMPLETE message and does it establish the initial security configuration?	-->	SECURITY MODE COMPLETE	2	P
13-15	Steps 8-10 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-
16	The SS transmits an IDENTITY REQUEST message (Security protected as per the algorithms specified in step 11).	<-	IDENTITY REQUEST	-	-
17	Check: Does the UE transmit an IDENTIY RESPONSE message (Security Protected as per the algorithms specified in step 11)?	->	IDENTITY RESPONSE	2	P
Note 1: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 4 to 12 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [31] clause 4.12.2.2 figure 4.12.2.2-1.					

9.2.2.1.3.3 Specific message contents

Table 9.2.2.1.3.3-0: REGISTRATION REJECT (Step 1F, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-9			
Information Element	Value/Remark	Comment	Condition

5GMM cause	'00000110'B	Illegal ME	
------------	-------------	------------	--

Table 9.2.2.1.3.3-1: SECURITY MODE COMMAND (Step 7, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Replayed UE security capabilities	Set to mismatch the security capability of UE under test		

Table 9.2.2.1.3.3-2: SECURITY MODE REJECT (Step 8, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-27			
Information Element	Value/Remark	Comment	Condition
5GMM cause	#23		

Table 9.2.2.1.3.3-3: IDENTITY REQUEST (Step 9, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-21			
Information Element	Value/Remark	Comment	Condition
Identity type	'0001'B	SUCI	

Table 9.2.2.1.3.3-4: IDENTITY RESPONSE (Step 10, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-22			
Information Element	Value/Remark	Comment	Condition
Mobile identity			
Type of identity	'001'B	SUCI	

Table 9.2.2.1.3.3-5: SECURITY MODE COMMAND (Step 11, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-25			
Information Element	Value/Remark	Comment	Condition
Selected NAS security algorithms			
Type of ciphering algorithm	Set according to PIXIT parameter for default ciphering algorithm if it is set to a value different to 5G-EA0, or, set to any value different to 5G-EA0 otherwise	Non-zero ciphering algorithm	
IMEISV request	Present		

Table 9.2.2.1.3.3-6: SECURITY MODE COMPLETE (Step 12, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-26			
Information Element	Value/Remark	Comment	Condition
IMEISV	Present		

Table 9.2.2.1.3.3-7: IDENTITY REQUEST (Step 16, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-21			
Information Element	Value/Remark	Comment	Condition
Identity type	'0011'B	IMEI	

Table 9.2.2.1.3.3-8: IDENTITY RESPONSE (Step 17, Table 9.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-22			
Information Element	Value/Remark	Comment	Condition
Mobile identity			
Type of identity	'011'B	IMEI	

9.2.2.2            Protection of initial NAS signalling messages

9.2.2.2.1            Test Purpose (TP)

Same Test purpose as in clause 9.1.2.2.1

9.2.2.2.2            Conformance requirements

Same conformance requirements as in clause 9.1.2.2.2

9.2.2.2.3            Test description

9.2.2.2.3.1           Pre-test conditions

System Simulator:

- WLAN Cell 27.

UE:

- None.

Preamble:

- The UE is in state 0W-B on WLAN Cell 27 according to TS 38.508-1 [4].
- The UE does not have a valid 5G NAS security context.

9.2.2.2.3.2           Test procedure sequence

Table 9.2.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The UE is switched on.	-	-	-	-
2-3	Steps 1-2 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 4 to 8 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [31] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
4	The UE transmits a REGISTRATION REQUEST message.	-->	REGISTRATION REQUEST	1	P
5	The SS transmits a <i>DLInformationTransfer</i> message and a AUTHENTICATION REQUEST message.	<--	AUTHENTICATION REQUEST	-	-
6	The UE transmits an <i>ULInformationTransfer</i> message and a AUTHENTICATION RESPONSE message.	-->	AUTHENTICATION RESPONSE	-	-
7	The SS transmits a <i>DLInformationTransfer</i> message and a SECURITY MODE COMMAND message.	<--	SECURITY MODE COMMAND		
8	The UE transmits an <i>ULInformationTransfer</i> message and a SECURITY MODE COMPLETE message.	-->	SECURITY MODE COMPLETE	2	P
9-11	Steps 8-10 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-

9.2.2.2.3.3 Specific message contents

Table 9.2.2.2.3.3-1: REGISTRATION REQUEST (Step 4, Table 9.2.2.2.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-6 using condition NON_CLEARTEXT_IE			
Information Element	Value/Remark	Comment	Condition

Table 9.2.2.2.3.3-2: SECURITY MODE COMPLETE (Step 8, Table 9.2.2.2.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-26			
Information Element	Value/Remark	Comment	Condition
NAS message container	Contents of Table 9.2.2.2.3.3-3		

Table 9.2.2.2.3.3-3: REGISTRATION REQUEST (Step 8, Table 9.2.2.2.3.2-1)

Derivation path: TS 38.508-1 [4],table 4.7.1-6 using condition CIPHERED_MESSAGE			
Information Element	Value/Remark	Comment	Condition

9.2.3 Void

9.2.4 Generic UE configuration

9.2.4.1 Generic UE configuration update

9.2.4.1.1 Test Purpose (TP)

(1)

```
with { UE in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { UE receives a new 5G-GUTI in the CONFIGURATION UPDATE COMMAND message and acknowledgement  
    from the UE is requested }  
  
    then { UE sends a CONFIGURATION UPDATE COMPLETE message and UE shall consider new 5G-GUTI as  
    valid }  
  
}
```

(2)

```
with { UE in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { UE receives a NITZ information in the CONFIGURATION UPDATE COMMAND message and  
    acknowledgement from the UE is not requested }  
  
    then { UE updates NITZ information }  
  
}
```

(3)

```
with { UE in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { UE receives CONFIGURATION UPDATE COMMAND message indicating “registration requested” and  
    contains no other parameters }  
  
    then { UE deletes any stored allowed NSSAI for this PLMN and then release the existing N1 NAS  
    signalling connection, starts a mobility registration procedure }  
  
}
```

(4)

```
with { UE in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { UE receives a new allowed NSSAI in the CONFIGURATION UPDATE COMMAND message and  
    registration is not requested }
```

```
    then { UE replaces any stored allowed NSSAI for this PLMN with new allowed NSSAI }  
  }
```

**9.2.4.1.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 4.6.2.2, 5.4.4.1, 5.4.4.2 and 5.4.4.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 4.6.2.2]

If available, the configured NSSAI(s) shall be stored in a non-volatile memory in the ME as specified in annex C.

...

If the UE receives the CONFIGURATION UPDATE COMMAND message indicating "registration requested" and contains no other parameters (see subclauses 5.4.4.2 and 5.4.4.3), the UE shall delete any stored allowed NSSAI for this PLMN, and delete any stored mapping of each S-NSSAI of the allowed NSSAI to the S-NSSAI(s) of the HPLMN, if available;

...

- d) When the UE receives the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message or in the CONFIGURATION UPDATE COMMAND message, the UE shall delete the network slicing information for each of the PLMNs that the UE has slicing information stored for (excluding the current PLMN). The UE shall not delete the default configured NSSAI. Additionally, the UE shall update the network slicing information for the current PLMN (if received) as specified above in bullets a), b) and c):

[TS 24.501 clause 5.4.4.1]

The purpose of this procedure is to:

- a) allow the AMF to update the UE configuration for access and mobility management-related parameters decided and provided by the AMF by providing new parameter information within the command; or
- b) request the UE to perform a registration procedure for mobility and periodic registration update towards the network to update access and mobility management-related parameters decided and provided by the AMF (see subclause 5.5.1.3).

This procedure is initiated by the network and can only be used when the UE has an established 5GMM context, and the UE is in 5GMM-CONNECTED mode. When the UE is in 5GMM-IDLE mode, the AMF may use the paging or notification procedure to initiate the generic UE configuration update procedure. The AMF can request a confirmation response in order to ensure that the parameter has been updated by the UE.

This procedure shall be initiated by the network to assign a new 5G-GUTI to the UE after a successful service request procedure invoked as a response to a paging request from the network and before the release of the N1 NAS signalling connection. If the service request procedure was triggered due to 5GSM downlink signalling pending, the procedure for assigning a new 5G-GUTI can be initiated by the network after the transport of the 5GSM downlink signalling.

The following parameters are supported by the generic UE configuration update procedure without the need to request the UE to perform the registration procedure for mobility and periodic registration update:

- a) 5G-GUTI;
- b) TAI list;
- c) Service area list;

- d) Network identity and time zone information (Full name for network, short name for network, local time zone, universal time and local time zone, network daylight saving time);
- e) LADN information;
- f) Rejected NSSAI;r
- g) Network slicing indication;
- h) Operator-defined access category definitions; and
- i) SMS indication.

The following parameters can be sent to the UE with or without a request to perform the registration procedure for mobility and periodic registration update:

- a) Allowed NSSAI; or
- b) Configured NSSAI.

The following parameter is sent to the UE with a request to perform the registration procedure for mobility and periodic registration update:

- a) MICO indication.

The following parameters are sent over 3GPP access only:

- a) LADN information;
- b) MICO indication;
- c) TAI list; and
- d) Service area list.

The following parameters are managed and sent per access type i.e., independently over 3GPP access or non 3GPP access:

- a) Allowed NSSAI; and
- b) Rejected NSSAI (when the NSSAI is rejected for the current registration area).

The following parameters are managed commonly and sent over 3GPP access or non 3GPP access:

- a) 5G-GUTI;
- b) Network identity and time zone information;
- c) Rejected NSSAI (when the NSSAI is rejected for the current PLMN);
- d) Configured NSSAI; and
- e) SMS indication.

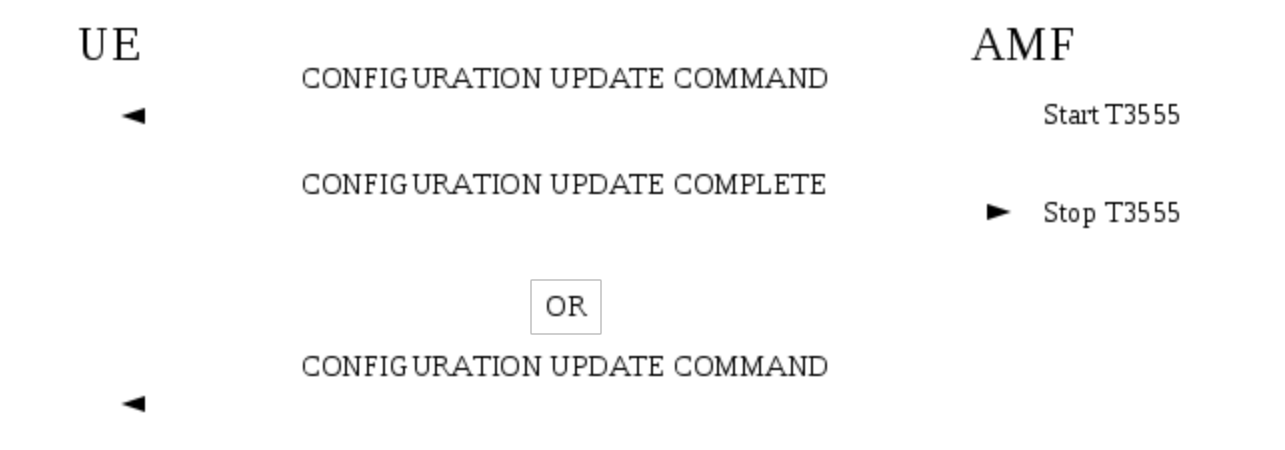


Figure 5.4.4.1.1: Generic UE configuration update procedure

[TS 24.501 clause 5.4.4.2]

The AMF shall initiate the generic UE configuration update procedure by sending the CONFIGURATION UPDATE COMMAND message to the UE.

The AMF shall in the CONFIGURATION UPDATE COMMAND message either:

- a) include one or more of the following parameters: 5G-GUTI, TAI list, allowed NSSAI that may include the mapped S-NSSAI(s), LADN information, service area list, MICO indication NITZ information, configured NSSAI that may include the mapped S-NSSAI(s), rejected NSSAI, network slicing indication, operator-defined access category definitions or SMS indication;
- b) include the Configuration update indication IE with the Registration requested bit set to "registration requested";  
or
- c) include a combination of both a) and b).

If an acknowledgement from the UE is requested, the AMF shall indicate "acknowledgement requested" in the Acknowledgement bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message and shall start timer T3555. Acknowledgement shall be requested for all parameters except when only NITZ is included.

To initiate parameter re-negotiation between the UE and network, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message.

If a new allowed NSSAI information or AMF re-configuration of supported S-NSSAIs requires an AMF relocation, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and include the Allowed NSSAI IE in the CONFIGURATION UPDATE COMMAND message.

If the AMF includes a new configured NSSAI in the CONFIGURATION UPDATE COMMAND message and the new configured NSSAI requires an AMF relocation as specified in 3GPP TS 23.501 [8], the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the message.

If the AMF indicates "registration requested" in the Registration requested bit of the Configuration update indication IE, acknowledgement shall be requested.

If changes to the allowed NSSAI require the UE to initiate a registration procedure, but the AMF is unable to determine an allowed NSSAI for the UE as specified in 3GPP TS 23.501 [8], the CONFIGURATION UPDATE COMMAND



message shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE, and shall not contain any other parameters.

If the AMF needs to update the LADN information, the AMF shall include the LADN information in the LADN information IE of the CONFIGURATION UPDATE COMMAND message.

During an established 5GMM context, the network may send none, one, or more CONFIGURATION UPDATE COMMAND messages to the UE. If more than one CONFIGURATION UPDATE COMMAND message is sent, the messages need not have the same content.

[TS 24.501 clause 5.4.4.3]

Upon receiving the CONFIGURATION UPDATE COMMAND message, the UE shall stop timer T3346 if running and use the contents to update appropriate information stored within the UE.

If "acknowledgement requested" is indicated in the Acknowledgement bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message, the UE shall send a CONFIGURATION UPDATE COMPLETE message.

If the UE receives a new 5G-GUTI in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new 5G-GUTI as valid, the old 5G-GUTI as invalid, stop timer T3519 if running, and delete any stored SUCI; otherwise, the UE shall consider the old 5G-GUTI as valid. The UE shall provide the 5G-GUTI to the lower layer of 3GPP access if the CONFIGURATION UPDATE COMMAND message is sent over the non-3GPP access, and the UE is in 5GMM-REGISTERED in both 3GPP access and non-3GPP access in the same PLMN.

If the UE receives a new TAI list in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new TAI list as valid and the old TAI list as invalid; otherwise, the UE shall consider the old TAI list as valid.

If the UE receives a new service area list in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new service area list as valid and the old service area list as invalid; otherwise, the UE shall consider the old service area list, if any, as valid.

If the UE receives new NITZ information in the CONFIGURATION UPDATE COMMAND message, the UE considers the new NITZ information as valid and the old NITZ information as invalid; otherwise, the UE shall consider the old NITZ information as valid.

If the UE receives a LADN information IE in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the old LADN information as invalid and the new LADN information as valid, if any; otherwise, the UE shall consider the old LADN information as valid.

If the UE receives a new allowed NSSAI for the associated access type in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new allowed NSSAI as valid for the associated access type, store the allowed NSSAI for the associated access type as specified in subclause 4.6.2.2 and consider the old allowed NSSAI for the associated access type as invalid; otherwise, the UE shall consider the old Allowed NSSAI as valid for the associated access type.

If the UE receives a new configured NSSAI in the CONFIGURATION UPDATE COMMAND message, the UE shall consider the new configured NSSAI for the registered PLMN as valid and the old configured NSSAI for the registered PLMN as invalid; otherwise, the UE shall consider the old configured NSSAI for the registered PLMN as valid. The UE shall store the new configured NSSAI as specified in subclause 4.6.2.2.

If the UE receives the Network slicing indication IE in the CONFIGURATION UPDATE COMMAND message with the Network slicing subscription change indication set to "Network slicing subscription changed", the UE shall delete the network slicing information for each and every PLMN except for the current PLMN as specified in subclause 4.6.2.2.

If the UE receives Operator-defined access category definitions IE in the CONFIGURATION UPDATE COMMAND message and the Operator-defined access category definitions IE contains one or more operator-defined access category

definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the CONFIGURATION UPDATE COMMAND message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the CONFIGURATION UPDATE COMMAND message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE receives the SMS indication IE in the CONFIGURATION UPDATE COMMAND message with the SMS availability indication set to:

- a) "SMS over NAS not available", the UE shall consider that SMS over NAS transport is not allowed by the network; and
- b) "SMS over NAS available", the UE may request the use of SMS over NAS transport by performing a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3, after the completion of the generic UE configuration update procedure.

If the CONFIGURATION UPDATE COMMAND message indicates "registration requested" in the Registration requested bit of the Configuration update indication IE and:

- a) contains no other parameters or contains at least one of the following parameters: a new allowed NSSAI, a new configured NSSAI or the Network slicing subscription change indication, and:
  - 1) an emergency PDU session exists, the UE shall, after the completion of the generic UE configuration update procedure and the release of the emergency PDU session, release the existing N1 NAS signalling connection, and start a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3; or
  - 2) no emergency PDU Session exists, the UE shall, after the completion of the generic UE configuration update procedure and the release of the existing N1 NAS signalling connection, start a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3; or
- b) an MICO indication is included without a new allowed NSSAI or a new configured NSSAI, the UE shall, after the completion of the generic UE configuration update procedure, start a registration procedure for mobility and registration update as specified in subclause 5.5.1.3 to re-negotiate MICO mode with the network.

The UE receiving the rejected NSSAI in the CONFIGURATION UPDATE COMMAND message takes the following actions based on the rejection cause in the rejected NSSAI:

"S-NSSAI not available in the current PLMN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current PLMN until switching off the UE or the UICC containing the USIM is removed.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current registration area as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current registration area until switching off the UE, the UE moving out of the current registration area or the UICC containing the USIM is removed.

9.2.4.1.3

Test description

9.2.4.1.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state 3W-A on WLAN Cell 27 according to TS 38.508-1 [4].

9.2.4.1.3.2

Test procedure sequence

Table 9.2.4.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The SS transmits a CONFIGURATION UPDATE COMMAND message including a new 5G-GUTI.	<--	CONFIGURATION UPDATE COMMAND	-	-
2	Check: Does UE transmit a CONFIGURATION UPDATE COMPLETE message?	-->	CONFIGURATION UPDATE COMPLETE	1	P
3	The SS transmits an IDENTITY REQUEST requesting 5G-GUTI in the IE identity type	<--	IDENTITY REQUEST	-	-
4	Check: Does the UE respond with an IDENTITY RESPONSE message with including the new 5G-GUTI assigned in step 1 in the 5GS mobile identity IE?	-->	IDENTITY RESPONSE	1	P
5	The SS transmits a CONFIGURATION UPDATE COMMAND message including NITZ information.	<--	CONFIGURATION UPDATE COMMAND	-	-
6	Check: Does the UE transmit a CONFIGURATION UPDATE COMPLETE message within the expiry of T3555?	-->	CONFIGURATION UPDATE COMPLETE	2	F
7	Check: Using MMI/AT command verify the NITZ update on the UE.	-	-	2	P
8	Switch off procedure in Ipsec_SA_Established specified in TS 38.508-1 [4] subclause 4.9.6.5 is performed.	-	-	-	-
9	The UE is switched On.	-	-	-	-
10-16	Steps 1 to 7 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 [4] subclause 4.5.2 are performed.	-	-	-	-
17	The SS transmits a REGISTRATION ACCEPT message including Configured NSSAI.	<--	REGISTRATION ACCEPT	-	-
17A-17B	Steps 9 to 10 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 [4] subclause 4.5.2 are performed.	-	-	-	-
18	The SS transmits a CONFIGURATION UPDATE COMMAND message including registration requested IE.	<--	CONFIGURATION UPDATE COMMAND	-	-
19	The UE transmits a CONFIGURATION UPDATE COMPLETE message.	-->	CONFIGURATION UPDATE COMPLETE	-	-
19A	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
20	Check: Does UE transmit a REGISTRATION REQUEST message with registration type value set to "Mobility" and including the Requested NSSAI?	-->	REGISTRATION REQUEST	3	P
21-25	Void	-	-	-	-
26	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
27	The UE transmits a REGISTRATION COMPLETE message.	-	REGISTRATION COMPLETE	-	-
27A	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
28	Check: Using MMI/AT command (+C5GNSSAIRDP) verify the update of allowed NSSAI.	-	-	3	P
28A	Steps 1 to 2 of the generic procedure for	-	-	-	-

- 28B	WLAN IPsec_SA_Established specified in TS 38.508-1 [4] subclause 4.5.4.2-4 are performed.				
29	The SS transmits a CONFIGURATION UPDATE COMMAND message including a new allowed NSSAI list.	<--	CONFIGURATION UPDATE COMMAND	-	-
30	The UE transmits a CONFIGURATION UPDATE COMPLETE message.	-->	CONFIGURATION UPDATE COMPLETE	-	-
31	Check: Using MMI/AT command (+C5GNSSAIRDP) verify the update of allowed NSSAI.	-	-	4	P

9.2.4.1.3.3 Specific message contents

Table 9.2.4.1.3.3-1: CONFIGURATION UPDATE COMMAND (step 1, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	0001	Acknowledgement (ACK) requested	
5G-GUTI	Other than the default value		

Table 9.2.4.1.3.3-2: IDENTITY REQUEST (step 3, Table 9.2.4.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'010'B	5G-GUTI	

Table 9.2.4.1.3.3-3: IDENTITY RESPONSE (step 4, Table 9.2.4.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
mobile identity IE	5G-GUTI assigned in step 1	5G-GUTI	

Table 9.2.4.1.3.3-4: CONFIGURATION UPDATE COMMAND (step 5, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Full name for network	Present		
Universal time and local time zone	Present		

Table 9.2.4.1.3.3-5: REGISTRATION ACCEPT (step 17, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	'010'B	Non-3GPP access	
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.4.1.3.3-6: CONFIGURATION UPDATE COMMAND (step 18, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	0010	Registration requested	

Table 9.2.4.1.3.3-7: REGISTRATION REQUEST (step 33, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'010'B		MOBILITY
Requested NSSAI			
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000011'B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.4.1.3.3-8: REGISTRATION ACCEPT (step 20, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	'010'B	Non-3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 3	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000011'B	3	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.4.1.3.3-9: CONFIGURATION UPDATE COMMAND (step 30, Table 9.2.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-19			
Information Element	Value/remark	Comment	Condition
Configuration update indication	0001	Acknowledgement (ACK) requested	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

9.2.5Registration

9.2.5.1Initial Registration

9.2.5.1.1Initial registration / Success / 5G-GUTI reallocation, Last visited TAI

9.2.5.1.1.1Test Purpose (TP)

(1)

with { the UE has no valid 5G-GUTI but available SUCI and switched off }

ensure that {

when { the UE is switched on }

```
    then { the UE sends a REGISTRATION REQUEST message including the SUCI in the 5GS mobile identity
IE }

    }
```

(2)

```
with { the UE is 5GMM-REGISTERED state with assigned 5G-GUTI and last visited registered TAI and
switched off }

ensure that {

    when { the UE is switched on }

        then { the UE sends a REGISTRATION REQUEST message including the 5G-GUTI assigned previously in
the 5GS mobile identity IE and the last visited registered TAI }

    }
```

9.2.5.1.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.5.1.2.2 and 5.5.1.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.2]

The UE initiates the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF, starting timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

During initial registration the UE handles the 5GS mobile identity IE in the following order:

- ...
- b) if the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by the same PLMN with which the UE is performing the registration, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;
  - c) if the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by an equivalent PLMN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;
  - d) if the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP, by any other PLMN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;
  - e) if a SUCI is available the UE shall include the SUCI in the 5GS mobile identity IE; and

If the SUCI is included in the 5GS mobile identity IE and the timer T3519 is not running, the UE shall start timer T3519 and store the value of the SUCI sent in the REGISTRATION REQUEST message. The UE shall include the stored SUCI in the REGISTRATION REQUEST message while timer T3519 is running.

...

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

[TS 24.501, clause 5.5.1.2.4]



The 5G-GUTI reallocation shall be part of the initial registration procedure. During the initial registration procedure, if the AMF has not allocated a new 5G-GUTI by the generic UE configuration update procedure, the AMF shall include in the REGISTRATION ACCEPT message the new assigned 5G-GUTI together with the assigned TAI list.

9.2.5.1.1.3            Test description

9.2.5.1.1.3.1        Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state Switched OFF (state 0W-B) according to TS 38.508-1 [4].

9.2.5.1.1.3.2        Test procedure sequence

Table 9.2.5.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		
1	The UE is switched on.	-	-	-	-
2-8	UE establishes an IPSEC SA and trigger 5GMM Registration procedure by executing steps 1 to 7 of Table 4.5.2.2-3 in TS38.508-1 [4].	-	-	-	-
9	SS transmits an REGISTRATION REJECT message with the 5GMM cause IE setting as “Illegal ME”. NOTE1: 5G-GUTI-1 should be deleted, then UE has no valid 5G-GUTI but available SUCI now.	<--	REGISTRATION REJECT	-	-
10	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
11	If possible (see ICS) switch off is performed or the USIM is removed. Otherwise the power is removed.	-	-	-	-
12	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
13-23	Steps 1-11 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed	-	-	1	P
24	If possible (see ICS) switch off is performed or the USIM is removed. Otherwise the power is removed.	-	-	-	-
25	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
26-35	Steps 1-11 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed	-	-	2	P

9.2.5.1.1.3.3

Specific message contents

Table 9.2.5.1.1.3.3-1: Message REGISTRATION REJECT (step 9, Table 9.2.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-9			
Information Element	Value/Remark	Comment	Condition
5GMM cause	'0000 0011'B	Illegal UE	

Table 9.2.5.1.1.3.3-2: Message REGISTRATION REQUEST (step 15, Table 9.2.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'0000 0001'B	Initial registration	
5GS mobile identity	SUCI	The SUCI of UE	

Table 9.2.5.1.1.3.3-3: Message REGISTRATION ACCEPT (step 21, Table 9.2.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-7			
Information Element	Value/Remark	Comment	Condition
5G-GUTI	5G-GUTI-2		

Table 9.2.5.1.1.3.3-4: Message REGISTRATION REQUEST (step 34, Table9.2.5.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
5GS registration type	'0000 0001'B	Initial registration	
5GS mobile identity	5G-GUTI-2		
Last visited registered TAI	TAI-1	N3GPP TAI	

9.2.5.1.2

Initial registration / 5GS services / NSSAI handling

9.2.5.1.2.1

Test Purpose (TP)

(1)

with { UE has sent a REGISTRATION REQUEST message including requested NSSAI}

ensure that {

    when { UE receives REGISTRATION ACCEPT message with allowed NSSAI }

        then { UE shall replace any stored allowed NSSAI for the current PLMN with new allowed NSSAI for the current PLMN }

    }

(2)

**with** { UE has sent a REGISTRATION REQUEST message including Requested NSSAI}

**ensure that** {

**when** { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause “S-NSSAI not available in the current PLMN” }

**then** { UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and not attempt to use the Rejected NSSAI in the current PLMN until switching off the UE or the UICC containing the USIM is removed }

    }

(3)

**with** { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause “S-NSSAI not available in the current PLMN” }

**ensure that** {

**when** { UE has been switched off, then switched on }

**then** { UE shall delete the stored Rejected NSAAI and shall send the NSSAI in Requested NSSAI IE of the REGISTRATION REQUEST message as per the configured and Allowed NSSAI for current PLMN }

    }

(4)

**with** { UE has sent a REGISTRATION REQUEST message including Requested NSSAI}

**ensure that** {

**when** { UE receives REGISTRATION ACCEPT message with Rejected NSSAI with reject cause “S-NSSAI not available in the current registration area” }

**then** { UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and registration area combination and not attempt to use the Rejected NSSAI in the current registration area until switching off the UE, the UE moving out of the current registration area or the UICC containing the USIM is removed }

    }

9.2.5.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 5.5.1.2.2 and 5.5.1.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 5.5.1.2.2]

5.5.1.2.1 General

This procedure can be used by a UE for initial registration for 5GS services.

...

The UE shall include the requested NSSAI containing the S-NSSAI(s) corresponding to the slice(s) to which the UE wants to register and shall include the mapping of the requested NSSAI which is the mapping of each S-NSSAI of the

requested NSSAI to the S-NSSAI(s) of the HPLMN, if available, in the REGISTRATION REQUEST message. If the UE has allowed NSSAI or configured NSSAI for the current PLMN, the requested NSSAI shall be either:

- a) the configured NSSAI for the current PLMN, or a subset thereof as described below, if the UE has no allowed NSSAI for the current PLMN;
- b) the allowed NSSAI for the current PLMN, or a subset thereof as described below, if the UE has an allowed NSSAI for the current PLMN; or
- c) the allowed NSSAI for the current PLMN, or a subset thereof as described below, plus one or more S-NSSAIs from the configured NSSAI for which no corresponding S-NSSAI is present in the allowed NSSAI and those are neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current PLMN and registration area combination.

If the UE has neither allowed NSSAI for the current PLMN nor configured NSSAI for the current PLMN and has a default configured NSSAI, the UE shall:

- a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and
- b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has no allowed NSSAI for the current PLMN, no configured NSSAI for the current PLMN, and no default configured NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION message.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to the current PLMN, if the S-NSSAI is neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current PLMN and registration area combination.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for the current PLMN.

NOTE 3: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation.

NOTE 4: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

[TS 24.501 clause 5.5.1.2.4]

The AMF shall include the allowed NSSAI for the current PLMN and shall include the mapping of each S-NSSAI of the allowed NSSAI to the S-NSSAI(s) of the HPLMN contained in the requested NSSAI from the UE if available, in the REGISTRATION ACCEPT message if the UE included the requested NSSAI in the REGISTRATION REQUEST message and the AMF allows one or more S-NSSAIs in the requested NSSAI. The AMF may also include rejected NSSAI in the REGISTRATION ACCEPT message. Rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s).

The AMF may include a new configured NSSAI for the current PLMN in the REGISTRATION ACCEPT message if:

- a) the REGISTRATION REQUEST message did not include the requested NSSAI;
- b) the REGISTRATION REQUEST message included the requested NSSAI containing an S-NSSAI that is not valid in the serving PLMN; or
- c) the REGISTRATION REQUEST message included the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI".

If a new configured NSSAI for the current PLMN is included in the REGISTRATION ACCEPT message, the AMF shall also include the mapping of the configured NSSAI for the current PLMN the S-NSSAI(s) of the HPLMN if

available in the REGISTRATION ACCEPT message. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF shall include the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message if the UDM has indicated that the subscription data for network slicing has changed. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The UE receiving the rejected NSSAI in the REGISTRATION ACCEPT message takes the following actions based on the rejection cause in the rejected NSSAI:

"S-NSSAI not available in the current PLMN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current PLMN until switching off the UE or the UICC containing the USIM is removed.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN and registration area combination as specified in subclause 4.6.2.2 and not attempt to use this S-NSSAI in the current registration area until switching off the UE, the UE moving out of the current registration area or the UICC containing the USIM is removed.

If the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the requested NSSAI are present in the subscribed S-NSSAIs, and one or more subscribed S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) marked as default are available, the AMF shall put the subscribed S-NSSAIs marked as default in the allowed NSSAI of the REGISTRATION ACCEPT message. The AMF shall determine a registration area such that all S-NSSAIs of the allowed NSSAI are available in the registration area.

9.2.5.1.2.3

Test description

9.2.5.1.2.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- UE is previously registered on WLAN Cell 27 using default message contents according to TS 38.508-1 [4];
- Empty URSP Configuration.

Preamble:

- The UE is in state Switched OFF (state 0W-B) according to TS 38.508-1 [4].

9.2.5.1.2.3.2

Test procedure sequence

Table 9.2.5.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The UE is switched on.	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 2 to 6 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [33] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
2	Check: Does UE transmit a REGISTRATION REQUEST message?	-->	REGISTRATION REQUEST	-	-
3-6	Steps 4 to 7 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
7	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI and Configured NSSAI.	<--	REGISTRATION ACCEPT	-	-
8	Step 10 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
9	Switch off procedure in WLAN Ipsec_SA_Established specified in TS 38.508-1 subclause 4.9.6.5 is performed.	-	-	-	-
10	The UE is brought back to operation or the USIM is inserted.	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 11 to 15 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [33] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
11	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	1	P
12-15	Steps 4 to 7 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
16	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI and Rejected NSSAI.	<--	REGISTRATION ACCEPT	-	-
17	Step 10 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
18	Switch off procedure in WLAN Ipsec_SA_Established specified in TS 38.508-1 subclause 4.9.6.5 is performed.	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 19 to 23 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [33] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
19	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	2	P
20-23	Steps 4 to 7 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
24	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
25	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
26	Step 10 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
27	Check: Is S-NSSAI=2 in the Rejected NSSAI	-	-	2	P

	list with cause "S-NSSAI not available in the current PLMN" associated with current PLMN using AT/MMI?				
28	Switch off procedure in WLAN Ipsec_SA_Established specified in TS 38.508-1 subclause 4.9.6.5 is performed.	-	-	-	-
29	The UE is brought back to operation or the USIM is inserted	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 30 to 34 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [33] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
30	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	3	P
31-34	Steps 4 to 7 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
35	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI and Rejected NSSAI.	<--	REGISTRATION ACCEPT	-	-
36	Step 10 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
37	Check: Is S-NSSAI=2 removed from the Rejected NSSAI list associated with current PLMN?	-	-	3	P
37A	Check: Is S-NSSAI=1 in the Rejected NSSAI list with cause "S-NSSAI not available in the current registration area" associated with current PLMN and registration area combination using AT/MMI?	-	-	4	P
38	Switch off procedure in WLAN Ipsec_SA_Established specified in TS 38.508-1 subclause 4.9.6.5 is performed.	-	-	-	-
39	The UE is brought back to operation or the USIM is inserted	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 40 to 44 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [33] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
40	Check: Does UE transmit a REGISTRATION REQUEST message including Requested NSSAI?	-->	REGISTRATION REQUEST	4	P
41-44	Steps 4 to 7 of the generic procedure for WLAN Ipsec_SA_Released specified in TS 38.508-1 subclause 4.5.2 are performed.	-	-	-	-
45	The SS transmits a REGISTRATION ACCEPT message including Allowed NSSAI.	<--	REGISTRATION ACCEPT	-	-
46	The UE transmits a REGISTRATION COMPLETE message.	-->	REGISTRATION COMPLETE	-	-
47	Check: Is S-NSSAI=1 in the Rejected NSSAI list with cause "S-NSSAI not available in the current registration area" associated with current PLMN and registration area combination using AT/MMI?	-	-	4	P

9.2.5.1.2.3.3Specific message contents

Table 9.2.5.1.2.3.3-1: REGISTRATION REQUEST (step 2, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =1 will be always included from the allowed NSSAI list associated with PLMN of WLAN Cell 27 by the UE but may include other S-NSSAI from Configured NSSAI list associated with PLMN of NCG WLAN Cell 27 if configured in the UE. See TS 24.501 sub-clause 5.5.1.2.1			

Table 9.2.5.1.2.3.3-2: REGISTRATION ACCEPT (step 7, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'010'B	Non 3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Configured NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.5.1.2.3.3-3: PDU SESSION ESTABLISHMENT ACCEPT (step 10, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 clause 4.7.2-2			
Information Element	Value/remark	Comment	Condition
S-NSSAI			
Length of S-NSSAI contents	'0000 0001'B	SST	
SST	'0000 0010'B	SST value 2	

Table 9.2.5.1.2.3.3-4: REGISTRATION REQUEST (step 11, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition



5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 2	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =2 will be always included by the UE from the allowed NSSAI list associated with PLMN of NCG WLAN Cell 27 but may include S-NSSAI =1 from Configured NSSAI list associated with PLMN of NCG WLAN Cell 27. See TS 24.501 sub-clause 5.5.1.2.1			

Table 9.2.5.1.2.3.3-5: REGISTRATION ACCEPT (step 16, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'010'B	Non 3GPP access	
Allowed NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Rejected NSSAI			
Rejected S-NSSAI-1		Rejected S-NSSAI value 1	
Cause value	'0000'B	S-NSSAI not available in the current PLMN	
SST	'00000010'B	2	
SD	Not Present		
Note: If UE has requested only S-NSSAI =2 in step 22 and S-NSSAI =2 is added in the Rejected NSSAI list by the SS then AMF/SS can include default subscribed S-NSSAIs in the allowed NSSAI of REGISTRATION ACCEPT message, see TS 24.501 sub-clause 5.5.1.2.4.			

Table 9.2.5.1.2.3.3-6: REGISTRATION REQUEST (step 19, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'001'B	Initial registration	
Requested NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.5.1.2.3.3-7: REGISTRATION ACCEPT (step 24, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result value	'010'B	Non 3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.5.1.2.3.3-8: REGISTRATION REQUEST (step 30, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'001'B	Initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	Note
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	1	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Note: S-NSSAI =1 will be always included by the UE from the allowed NSSAI list associated with PLMN of NCG Cell C but may include S-NSSAI =2 from Configured NSSAI list associated with PLMN of NCG Cell C. See TS 24.501 sub-clause 5.5.1.2.1			

Table 9.2.5.1.2.3.3-9: REGISTRATION ACCEPT (step 35, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	'010'B	Non 3GPP access	
TAI list			
Type of list	'01'B	list of TACs belonging to one PLMN, with consecutive TAC values	
Number of elements	'00001'B	2 Elements	
TAC	PLMN =MCC/MNC stored in EF <sub>IMSI</sub> TAC 1 = 2	TAI2, TAI 3	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000010'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		
Rejected NSSAI			
Rejected S-NSSAI-1		Rejected S-NSSAI value 1	
Cause value	'0001'B	S-NSSAI not available in the current registration area	
SST	'00000001'B	1	
SD	Not Present		
Note: If UE has requested only S-NSSAI =1 in step 57 and S-NSSAI =1 is added in the Rejected NSSAI list by the SS then AMF/SS can include default subscribed S-NSSAIs in the allowed NSSAI of REGISTRATION ACCEPT message, see TS 24.501 sub-clause 5.5.1.2.4.			

Table 9.2.5.1.2.3.3-10: PDU SESSION ESTABLISHMENT ACCEPT (step 36, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 clause 4.7.2-2			
Information Element	Value/remark	Comment	Condition
S-NSSAI			
Length of S-NSSAI contents	'0000 0001'B	SST	
SST	'0000 0010'B	SST value 2	

Table 9.2.5.1.2.3.3-11: REGISTRATION REQUEST (step 40, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type value	'001'B	initial registration	
Requested NSSAI		Note	
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	'00000001'B	SST	
SST	'00000001'B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

Table 9.2.5.1.2.3.3-12: REGISTRATION ACCEPT (step 45, Table 9.2.5.1.2.3.2-1)

Derivation path: TS 38.508-1 Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS registration result value	‘010’B	Non 3GPP access	
Allowed NSSAI			
S-NSSAI IEI		S-NSSAI value 1	
Length of S-NSSAI contents	‘00000010’B	SST	
SST	‘00000001’B	2	
SD	Not Present		
Mapped configured SST	Not Present		
Mapped configured SD	Not Present		

9.2.5.1.3            Void

9.2.5.1.4            Initial registration / Rejected / Congestion / Abnormal cases / T3346

9.2.5.1.4.1            Test Purpose (TP)

(1)

with { The UE has sent initial REGISTRAION REQUEST message }

ensure that {

    when { UE receives a REGISTRATION REJECT with cause #22 (Congestion) with T3346 included and the UE is NOT configured for High Priority Access }

        then { UE does not start the Initial registration until T3346 expires }

    }

(2)

with { The UE has received initial REGISTRATION REJECT with T3346 included }

ensure that {

    when { upon expiry of T3346 }

        then { UE starts the Initial registration procedure }

    }

(3)

with { The UE has received initial REGISTRATION REJECT with T3346 included }

ensure that {

    when { the timer T3346 is running and the UE needs to perform initial registration for emergency services }

        then { UE starts the Initial registration procedure }

    }

**9.2.5.1.4.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.1.2.5 and 5.5.1.2.7 and TS 24.301, clause 5.5.1.2.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a back-off timer T3346.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

#3 (Illegal UE); or

#6 (Illegal ME).

...

#22 (Congestion).

If the T3346 value IE is present in the REGISTRATION REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall proceed as described below; otherwise it shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.2.7.

The UE shall abort the initial registration procedure, set the 5GS update status to 5U2 NOT UPDATED and enter state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION.

The UE shall stop timer T3346 if it is running.

If the REGISTRATION REJECT message is integrity protected, the UE shall start timer T3346 with the value provided in the T3346 value IE.

If the REGISTRATION REJECT message is not integrity protected, the UE shall start timer T3346 with a random value from the default range specified in 3GPP TS 24.008 [12].

The UE stays in the current serving cell and applies the normal cell reselection process. The initial registration procedure is started if still needed when timer T3346 expires or is stopped.

If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

...

Other values are considered as abnormal cases. The behaviour of the UE in those cases is specified in subclause 5.5.1.2.7.

[TS 24.501, clause 5.5.1.2.7]

The following abnormal cases can be identified:

- a) Timer T3346 is running.

The UE shall not start the registration procedure for initial registration unless:

- 1) the UE is a UE configured for high priority access in selected PLMN;

2) the UE needs to perform the registration procedure for initial registration for emergency services; or

3) the UE receives a DEREGISTRATION REQUEST message with the "re-registration required" indication.

The UE stays in the current serving cell and applies the normal cell reselection process.

NOTE 1: It is considered an abnormal case if the UE needs to initiate a registration procedure for initial registration while timer T3346 is running independent on whether timer T3346 was started due to an abnormal case or a non-successful case.

[TS 24.301, clause 5.5.1.2.5]

...

#22 (Congestion);

If the T3346 value IE is present in the ATTACH REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall proceed as described below; otherwise it shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.2.6.

The UE shall abort the attach procedure, reset the attach attempt counter, set the EPS update status to EU2 NOT UPDATED and enter state EMM-DEREGISTERED.ATTEMPTING-TO-ATTACH.

The UE shall stop timer T3346 if it is running.

If the ATTACH REJECT message is integrity protected, the UE shall start timer T3346 with the value provided in the T3346 value IE.

If the ATTACH REJECT message is not integrity protected, the UE shall start timer T3346 with a random value from the default range specified in 3GPP TS 24.008 [13].

The UE stays in the current serving cell and applies the normal cell reselection process. The attach procedure is started if still needed when timer T3346 expires or is stopped.

If A/Gb mode or Iu mode is supported by the UE, the UE shall in addition handle the GMM parameters GMM state, GPRS update status and GPRS attach attempt counter as specified in 3GPP TS 24.008 [13] for the case when the normal attach procedure is rejected with the GMM cause with the same value.

If the UE is operating in single-registration mode, the UE shall in addition handle the 5GMM parameters as specified in 3GPP TS 24.501 [54] for the case when the initial registration procedure is rejected with the 5GMM cause with the same value.

...

9.2.5.1.4.3

Test description

9.2.5.1.4.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

None.

Preamble:

- The UE is in state Switched OFF (State 0W-A as per TS 38.508-1 [4] Table 4.4A.2-0).

9.2.5.1.4.3.2 Test procedure sequence

Table 9.2.5.1.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	UE is switched on.	-	-	-	
2-8	Steps 1-7 of Table 4.5.2.2-3 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
9	SS transmits a REGISTRATION REJECT message with cause #22 (Congestion) and T3346 set to 3 minutes. (Note 1)	<--	REGISTRATION REJECT	-	-
10	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
11	Check: Does the UE initiate IPsec secure tunnel as per 3GPP TS 24.502 [33] clause 7.3.2 within T3346 minutes of Step 9? (Note 1)	-	-	1	F
12-18	Steps 1-7 of Table 4.5.2.2-3 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	2	P
19	SS transmits a REGISTRATION REJECT message with cause #22 (Congestion) and T3346 set to 3 minutes. (Note 1)	<--	REGISTRATION REJECT	-	-
20	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
21	The UE is made to establish an emergence PDU session. This can be done by an AT/MMI command	-	-	-	-
22-32	Steps 1-11 of Table 4.5.2.2-2 of the generic procedure in TS 38.508-1 [4] are performed, REGISTRATION REQUEST message with IE 5GS registration type set to "Initial registration"	-	-	3	P
Note 1: T3346 is set to 3 minutes. This is checked for 3 minutes less tolerance.					

9.2.5.1.4.3.3 Specific message contents

Table 9.2.5.1.4.3.3-1: REGISTRATION REJECT (steps 9, 19 Table 9.2.5.1.4.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 0110'B	Cause #22 (Congestion)	
T3346 Value	'00100011'B	3 minutes	

Table 9.2.5.1.4.3.3-2: REGISTRATION REQUEST (step 25 Table 9.2.5.1.4.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'001'B	Initial registration	

9.2.5.2        Mobility Registration

9.2.5.2.1        Mobility registration update / registered slice(s) change

9.2.5.2.1.1        Test Purpose (TP)

with { UE in state 5GMM-REGISTERED, and 5GMM-IDLE mode over non 3GPP access }

ensure that {

    when { UE needs to change the slice(s) currently registered to }

        then { UE initiates and successfully completes the registration procedure for mobility registration update }

    }

9.2.5.2.1.2        Conformance requirements

Same conformance requirements as in clause 9.1.5.2.6.2

9.2.5.2.1.3        Test description

9.2.5.2.1.3.1        Pre-test conditions

System Simulator:

WLAN Cell 27

UE:

-None

Preamble:

The UE is in state 3W-A with PDU session Active state according to TS 38.508-1 [4].

9.2.5.2.1.3.2        Test procedure sequence

Table 9.2.5.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		



1	Make the UE change the slice(s) the UE is currently registered to. (NOTE 1)	-	-	-	-
2	The UE transmits an REGISTRATION REQUEST message indicating "mobility registration updating".	-->	5GMM: REGISTRATION REQUEST	1	P
3	SS sends a REGISTRATION ACCEPT message	<--	5GMM: REGISTRATION ACCEPT	-	-
4	Check: Does the UE send a REGISTRATION COMPLETE?	-->	5GMM: REGISTRATION COMPLETE	-	-
Note 1: This can be done by MMI or AT command - If the AT command +C5GNSSAI is to be used then in accordance with its definition (TS 27.007 [40], clause 10.1.62) it would need to be run 2 times: once to delete the stored in the UE default NSSAI, and, second time to allocate a new one - In the Preamble SS has sent one allowed S-NSSAI which the UE has accepted as the S-NSSAI it is registered to (see 38.508-1 [4], Table 4.7.1-7). A S-NSSAI different to that one needs to selected.					

9.2.5.2.1.3.3            Specific message contents

None.

NOTE: The UE is expected to request a new S-NSSAI in the REGISTRATION REQUEST message sent as part of step 2. However, due to this S-NSSAI being implementation dependent, there is no verification of the content of the REGISTRATION REQUEST message foreseen.

9.2.5.2.2                Mobility registration update/Change of SMS over NAS capability

9.2.5.2.2.1             Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED, and 5GMM-IDLE mode over non 3GPP access }

ensure that {

    when { UE needs to change the SMS over NAS capability }

    then { UE initiates and successfully completes the registration procedure for mobility registration update }

    }

9.2.5.2.2.2             Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 5.5.1.3.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

...

- l) when the UE needs to register for SMS over NAS, indicate a change in the requirements to use SMS over NAS, or de-register from SMS over NAS;

...

For a REGISTRATION REQUEST message with a 5GS registration type IE indicating "mobility registration updating", UE shall include the requested NSSAI containing the S-NSSAI(s) corresponding to the slices to which the UE intends to register with and shall include the mapped S-NSSAI(s) for the requested NSSAI, if available, in the REGISTRATION REQUEST message. If the UE has allowed NSSAI or configured NSSAI for the current PLMN, the requested NSSAI shall be either:

- a) the configured NSSAI for the current PLMN, or a subset thereof as described below, if the UE has no allowed NSSAI for the current PLMN;
- b) the allowed NSSAI for the current PLMN, or a subset thereof as described below, if the UE has an allowed NSSAI for the current PLMN; or
- c) the allowed NSSAI for the current PLMN, or a subset thereof as described below, plus one or more S-NSSAIs from the configured NSSAI for which no corresponding S-NSSAI is present in the allowed NSSAI and those are neither in the rejected NSSAI for the current PLMN nor in the rejected NSSAI for the current registration area.

If the UE has neither allowed NSSAI for the current PLMN nor configured NSSAI for the current PLMN and has a default configured NSSAI, the UE shall:

- a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and
- b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has no allowed NSSAI for the current PLMN, no configured NSSAI for the current PLMN, and no default configured NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION REQUEST message.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to this PLMN, if the S-NSSAI is neither in the rejected NSSAIs for the current PLMN nor in the rejected NSSAI for the current registration area.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for this PLMN.

NOTE 3: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation specific. The UE can take preferences indicated by the upper layers (e.g. policies, applications) into account.

9.2.5.2.2.3            Test description

9.2.5.2.2.3.1        Pre-test conditions

System Simulator:

WLAN Cell 27

UE:

UE is enabled for SMS over NAS

Preamble:

The UE is in state 3W-A with PDU session Active state according to TS 38.508-1 [4]SMS over NAS allowed.

9.2.5.2.1.3.2

Test procedure sequence

Table 9.2.5.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
1	Make the UE deregister the SMS over NAS NOTE 1)	-	-	-	-
2	The UE transmits an REGISTRATION REQUEST message indicating "mobility registration updating".	-->	5GMM: REGISTRATION REQUEST	1	P
3	SS sends a REGISTRATION ACCEPT message	<--	5GMM: REGISTRATION ACCEPT	-	-
4	Check: Does the UE send a REGISTRATION COMPLETE?	-->	5GMM: REGISTRATION COMPLETE	-	-
Note 1: This can be done by MMI or AT command +C5GUSMS					

9.2.5.2.1.3.3

Specific message contents

Table 9.2.5.2.1.3.3-1: REGISTRATION REQUEST (preamble)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'001'B		INITIAL
5GS update type			
SMS requested	SMS over NAS supported		

Table 9.2.5.2.1.3.3-2: REGISTRATION ACCEPT (preamble)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result			
SMS allowed	SMS over NAS allowed		
T3512 value			
Timer value	'00011'B		
Unit	'101'B		

Table 9.2.5.2.1.3.3-3: REGISTRATION REQUEST (Table 9.2.5.2.1.3.2-1, step 2)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS registration type			
5GS registration type value	'010'B		MOBILITY
5GS update type			
SMS requested	SMS over NAS not supported		

9.2.6 De-registration

9.2.6.1 UE-initiated de-registration

9.2.6.1.1 UE-initiated de-registration / switch off

9.2.6.1.1.1 Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { the UE is switched off }  
  
        then { the UE shall send DEREGISTRATION REQUEST message with De-registration type IE indicated to "Switch off" }  
  
    }

(2)

with { the UE supports remove USIM without power down and in 5GMM-REGISTERED state }  
  
ensure that {  
  
    when { the USIM is removed from the UE }  
  
        then { the UE shall send DEREGISTRATION REQUEST message with De-registration type IE indicated to "Switch off" }  
  
    }

(3)

with { the UE in 5GMM-DEREGISTERED-INTIATED state }  
  
ensure that {  
  
    when { the first four expiries of the timer T3521 }  
  
        then { the UE shall retransmit the DEREGISTRATION REQUEST message and shall reset and restart timer T3521 }  
  
    }

(4)

with { the UE in 5GMM-DEREGISTERED-INTIATED state }  
  
ensure that {  
  
    when { On the fifth expiry of timer T3521 }  
  
        then { the deregistration procedure shall be aborted and the UE perform local detach }  
  
    }

}

#### 9.2.6.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 5.5.2.1, 5.5.2.2.1 and 5.5.2.2.6. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.2.1]

The de-registration procedure is used:

- a) by the UE to de-register for 5GS services over 3GPP access when the UE is registered over 3GPP access;;
- b) by the UE to de-register for 5GS services over 3GPP access, non-3GPP access, or both when the UE is registered in the same PLMN over both accesses;
- c) by the network to inform the UE that it is deregistered for 5GS services over 3GPP access when the UE is registered over 3GPP access;
- d) by the network to inform the UE that it is deregistered for 5GS services over 3GPP access, non-3GPP access, or both when the UE is registered in the same PLMN over both accesses; and
- e) by the network to inform the UE to re-register to the network.

The de-registration procedure with appropriate de-registration type shall be invoked by the UE:

- a) if the UE is switched off; and
- b) as part of the eCall inactivity procedure defined in subclause 5.5.3.

The de-registration procedure with appropriate de-registration type shall be invoked by the network:

- a) if the network informs whether the UE should re-register to the network.

The de-registration procedure with appropriate access type shall be invoked by the UE:

- a) if the UE wants to de-register for 5GS services over 3GPP access when the UE is registered over 3GPP access;  
or
- b) the UE wants to de-register for 5GS services over 3GPP access, non-3GPP access, or both when the UE is registered in the same PLMN over both accesses.

If the de-registration procedure is triggered due to USIM removal, the UE shall indicate "switch off" in the de-registration type IE.

If the de-registration procedure is requested by the UDM for a UE that has an emergency PDU session, the AMF shall not send a DEREGISTRATION REQUEST message to the UE.

If the de-registration procedure for 5GS services is performed, the PDU sessions, if any, for this particular UE are released locally without peer-to-peer signalling between the UE and the network.

The UE is allowed to initiate the de-registration procedure even if the timer T3346 is running.

NOTE: When the UE has no PDU sessions over non-3GPP access, or the UE moves all the PDU sessions over a non-3GPP access to a 3GPP access, the UE and the AMF need not initiate de-registration over the non-3GPP access.

The AMF shall provide the UE with a non-3GPP de-registration timer.

[TS 24.501, clause 5.5.2.2.1]

The de-registration procedure is initiated by the UE by sending a DEREGISTRATION REQUEST message (see example in figure 5.5.2.2.1). The De-registration type IE included in the message indicates whether the de-registration procedure is due to a "switch off" or not. The access type included in the message indicates whether the de-registration procedure is:

- a) for 5GS services over 3GPP access when the UE is registered over 3GPP access only;
- b) for 5GS services over non-3GPP access when the UE is registered over non-3GPP access only; or
- c) for 5GS services over 3GPP access, non-3GPP access or both 3GPP access and non-3GPP access when the UE is registered in the same PLMN over both accesses.

If the UE has a valid 5G-GUTI, the UE shall populate the 5GS mobile identity IE with the valid 5G-GUTI. If the UE does not have a valid 5G-GUTI, the UE shall populate the 5GS mobile identity IE with its SUCI.

If the UE does not have a valid 5G-GUTI and it does not have a valid SUCI, then the UE shall populate the 5GS mobile identity IE with its PEI.

If the de-registration request is not due to switch off and the UE is in the state 5GMM-REGISTERED or 5GMM-REGISTERED-INITIATED, timer T3521 shall be started in the UE after the DEREGISTRATION REQUEST message has been sent. The UE shall enter the state 5GMM-DEREGISTERED-INITIATED.

If the UE is to be switched off, the UE shall try for a period of 5 seconds to send the DEREGISTRATION REQUEST message. During this period, the UE may be switched off as soon as the DEREGISTRATION REQUEST message has been sent.

[TS 24.501, clause 5.5.2.2.6]

...

- c) T3521 timeout.
  - On the first four expiries of the timer, the UE shall retransmit the DEREGISTRATION REQUEST message and shall reset and restart timer T3521. On the fifth expiry of timer T3521, the de-registration procedure shall be aborted and the UE proceeds as follows:

**9.2.6.1.1.3            Test description**

**9.2.6.1.1.3.1        Pre-test conditions**

**System Simulator:**

- WLAN Cell 27.

**UE:**

- None.

**Preamble:**

- The UE is in state 3W-A on WLAN Cell 27 according to 38.508-1[4].

9.2.6.1.1.3.2

Test procedure sequence

Table 9.2.6.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Cause switch off	-	-	-	-
2	Check: Does the UE transmit a DEREGISTRATION REQUEST with the De-registration type IE indicating "switch off"?	-->	DEREGISTRATION REQUEST	1	P
3	SS Transmits DEREGISTRATION ACCEPT	<--	DEREGISTRATION ACCEPT	-	-
4	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
5	The UE is switched on.	-	-	-	-
6-15	The registration procedure is completed by executing steps 1-10 of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-3.	-	-	-	-
16	Cause UE to initiate deregistration.	-	-	-	-
17	The UE transmits UE transmit a DEREGISTRATION REQUEST message. The UE starts timer T3521.	-->	DEREGISTRATION REQUEST	-	-
18	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
19	Check: When the timer T3521 expires does the UE re-transmit DETACH REQUEST message. Timer T3421 is re-started (1 <sup>st</sup> expiry).	-->	DEREGISTRATION REQUEST	3	P
20	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
21	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message. Timer T3521 is re-started (2 <sup>nd</sup> expiry).	-->	DEREGISTRATION REQUEST	3	P
22	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
23	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message. Timer T3521 is re-started (3 <sup>rd</sup> expiry).	-->	DEREGISTRATION REQUEST	3	P
24	The SS does not respond to the DEREGISTRATION REQUEST message.	-	-	-	-
25	Check: When the timer T3521 expires does the UE re-transmit DEREGISTRATION REQUEST message. Timer T3521 is re-started (4 <sup>th</sup> expiry).	-->	DEREGISTRATION REQUEST	3	P
26	The SS does not respond to the DETACH REQUEST message.	-	-	-	-
27	When the timer T3521 expires the UE aborts the detach procedure and performs a local detach (5 <sup>th</sup> expiry).	-	-	4	P
28	SS Transmits PDU SESSION MODIFICATION COMMAND	<--	PDU SESSION MODIFICATION COMMAND	-	-
29	Check: Does the UE transmit a PDU SESSION MODIFICATION COMPLETE?	-->	PDU SESSION MODIFICATION COMPLETE	4	F
30	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
-	EXCEPTION: Steps 31 to 46 shall be implemented if the UE supports remove USIM without power down: pc_USIM_Removal = TRUE [29]	-	-	-	-
31	The UE is switched off.	-	-	-	-
32	The UE is switched on.	-	-	-	-



33-42	The registration procedure is completed by executing steps 1-10 of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-3.	-	-	-	-
43	Cause removal of USIM from the UE without powering down.	-	-	-	-
44	Check: Does the UE transmit a DEREGISTRATION REQUEST with the De-registration type IE indicating "switch off"?	-->	DEREGISTRATION REQUEST	2	P
45	SS Transmits DEREGISTRATION ACCEPT	<--	DEREGISTRATION ACCEPT	-	-
46	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-

9.2.6.1.1.3.3            Specific message contents

Table 9.2.6.1.1.3.3-1: DEREGISTRATION REQUEST (Step 1 and step 44, Table 9.2.6.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-12			
Information Element	Value/Remark	Comment	Condition
De-registration type			
Switch off	'1'B		

9.2.6.2                Network-initiated de-registration

9.2.6.2.1             Network-initiated de-registration / De-registration for Non-3GPP access / Re-registration required

9.2.6.2.1.1           Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the SS sends a DEREGISTRATION REQUEST message indicates "re-registration required" and the de-registration request is for non 3GPP access }

    then { the UE sends a DEREGISTRATION ACCEPT message to the network and releases the existing NAS signalling connection, then initiates an initial registration and also re-establishes any previously established PDU sessions }

    }

9.2.6.2.1.2           Conformance requirements

References: The conformance requirement covered in the present TC is specified in: 3GPP TS 24.501 clauses 5.5.2.3.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 5.5.2.3.2]

NOTE 1: When the de-registration type indicates "re-registration required", user interaction is necessary in some cases when the UE cannot re-establish the PDU session (s), if any, automatically.

...

Upon sending a DEREGISTRATION ACCEPT message, the UE shall delete the rejected NSSAI as specified in subclause 4.6.2.2.

If the de-registration type indicates "re-registration required", then the UE shall ignore the 5GMM cause IE if received.

If the de-registration type indicates "re-registration not required", the UE shall take the actions depending on the received 5GMM cause value:

- #3 (Illegal UE);
- #6 (Illegal ME); or
- #7 (5GS services not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall consider the USIM as invalid for 5GS services until switching off or the UICC containing the USIM is removed. The UE shall delete the list of equivalent PLMNs and shall enter the state 5GMM-DEREGISTERED.

If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when a DETACH REQUEST is received with the EMM cause with the same value and with detach type set to "re-attach not required".

NOTE 2: The possibility to configure a UE so that the radio transceiver for a specific radio access technology is not active, although it is implemented in the UE, is out of scope of the present specification.

If the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

...

- #72 (Non-3GPP access to 5GCN not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter and enter the state 5GMM-DEREGISTERED.

NOTE 3: The 5GMM sublayer states, the 5GMM parameters and the registration status are managed per access type independently, i.e. 3GPP access or non-3GPP access (see subclauses 4.7.2 and 5.1.3).

The UE shall disable the N1 mode capability for non-3GPP access (see subclause 4.9.3).

As an implementation option, the UE may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

9.2.6.2.1.3

Test description

9.2.6.2.1.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27.

UE:

- None.

Preamble:

- the UE is in state 3W-A on WLAN Cell 27 according to TS 38.508-1 [4].

9.2.6.2.1.3.2            Test procedure sequence

Table 9.2.6.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message/PDU/SDU		
1	The SS transmits a DEREGISTRATION REQUEST with indicates "re-registration required".	<--	DEREGISTRATION REQUEST	-	-
2	Check: Does the UE transmits a DEREGISTRATION ACCEPT message?	-->	DEREGISTRATION ACCEPT	1	P
3	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
-	EXCEPTION: step 4 describes a behaviour which depends on the UE capability	-	-	-	-
4	IF NOT pc_Automatic_Re_registration, the user initiates a registration by MMI.	-	-	-	-
6-15	The registration procedure is completed by executing steps 1-10 of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-3.	-	-	1	P

9.2.6.2.1.3.3            Specific message contents

Table 9.2.6.2.1.3.3-1: DEREGISTRATION REQUEST (step 1, Table 9.2.6.2.1.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-14			
Information Element	Value/Remark	Comment	Condition
DEREGISTRATION type			
Switch off	'0'B	Normal de-registration	
Re-registration required	'1'B	re-registration required	
Access type	'10'B	Non 3GPP access	
5GMM cause	'0000 0011'B	Cause #3 (Illegal UE)	

Table 9.2.6.2.1.3.3-2: REGISTRATION REQUEST (step 8, Table 9.2.6.2.1.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GS mobile identity	The valid 5G-GUTI that UE holds		

9.2.6.2.2

Network-initiated de-registration / De-registration for Non 3GPP access / Re-registration not required

9.2.6.2.2.1

Test Purpose (TP)

(1)

```
with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, ""re-registration not required"" and the de-registration request is for npn-3GPP access and 5GMM cause value is not included }

    then { the UE deletes 5G-GUTI, TAI list, last visited registered TAI, list of equivalent PLMNs, ngKSI, sends a DEREGISTRATION ACCEPT message enter the state 5GMM-DEREGISTERED for non 3GPP access }

}
```

(2)

```
with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, "re-registration not required" and the de-registration request is for non-3GPP access and 5GMM cause value set to #7 5GS services not allowed }

    then { the UE deletes 5G-GUTI, TAI list, last visited registered TAI, list of equivalent PLMNs, ngKSI, consider the USIM as invalid for 5GS services until switching off or the UICC containing the USIM is removed, sends a DEREGISTRATION ACCEPT message enter the state 5GMM-DEREGISTERED for Non 3GPP access }

}
```

(3)

```
with { the UE in 5GMM-REGISTERED state }

ensure that {

    when { the SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, "re-registration not required" and the de-registration request is for non-3GPP access and 5GMM cause value set to #72 Non-3GPP access to 5GCN not allowed }

    then { the UE deletes 5G-GUTI, TAI list, last visited registered TAI, ngKSI, disable the N1 mode capability for non-3GPP access, sends a DEREGISTRATION ACCEPT message enter the state 5GMM-DEREGISTERED for Non 3GPP access }

}
```

9.2.6.2.2.2

Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501 clauses 5.5.2.3.2 and 5.5.2.3.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 5.5.2.3.2]

Upon receiving the DEREGISTRATION REQUEST message, if the DEREGISTRATION REQUEST message indicates "re-registration not required" and the de-registration request is for 3GPP access, the UE shall release locally

the PDU sessions over 3GPP access, if any. The UE shall send a DEREGISTRATION ACCEPT message to the network and enter the state 5GMM-DEREGISTERED for 3GPP access.

...

If the de-registration type indicates "re-registration not required", the UE shall take the actions depending on the received 5GMM cause value:

...

#7 (5GS services not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall consider the USIM as invalid for 5GS services until switching off or the UICC containing the USIM is removed. The UE shall delete the list of equivalent PLMNs and shall enter the state 5GMM-DEREGISTERED.

If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when a DETACH REQUEST is received with the EMM cause with the same value and with detach type set to "re-attach not required".

NOTE 2: The possibility to configure a UE so that the radio transceiver for a specific radio access technology is not active, although it is implemented in the UE, is out of scope of the present specification.

If the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

...

#72 (Non-3GPP access to 5GCN not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter and enter the state 5GMM-DEREGISTERED.

NOTE 3: The 5GMM sublayer states, the 5GMM parameters and the registration status are managed per access type independently, i.e. 3GPP access or non-3GPP access (see subclauses 4.7.2 and 5.1.3).

The UE shall disable the N1 mode capability for non-3GPP access (see subclause 4.9.3).

As an implementation option, the UE may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

[TS 24.501, clause 5.5.2.3.4]

- b) DEREGISTRATION REQUEST, other 5GMM cause values than those treated in subclause 5.5.2.3.2 or no 5GMM cause IE is included, and the De-registration type IE indicates "re-registration not required".

The UE shall delete 5G-GUTI, TAI list, last visited registered TAI, list of equivalent PLMNs, ngKSI, shall set the 5GS update status to 5U2 NOT UPDATED and shall start timer T3502.

A UE not supporting S1 mode may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5]; otherwise the UE shall enter the state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION.

A UE operating in single-registration mode shall:

- enter the state 5GMM-DEREGISTERED and attempt to select E-UTRAN radio access technology and proceed with the appropriate EMM specific procedures. In this case, the UE may disable N1 mode capability (see subclause 4.9); or
- enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

A UE operating in single-registration mode shall set the EPS update status to EU2 NOT UPDATED and shall delete the EMM parameters 4G-GUTI, last visited registered TAI, TAI list and eKSI and shall enter the state EMM-DEREGISTERED.

9.2.6.2.2.3

Test description

9.2.6.2.2.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27.

UE:

- None

Preamble:

- The UE is in state 3W-A on WLAN Cell 27 according to TS 38.508-1 [4].

9.2.6.2.2.3.2

Test procedure sequence

Table 9.2.6.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		

1	SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, "re-registration not required" and the de-registration request is for non 3GPP access	<--	NR 5GMM: DEREGISTRATION REQUEST	-	-
2	Check: Does the UE transmit an DEREGISTRATION ACCEPT message?	-->	NR 5GMM: DEREGISTRATION ACCEPT	1	P
3	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
4	Cause UE to initiate registration.	-	-	-	-
5-15	The registration procedure is completed by executing steps 1-10 of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-3.	-	-	1	P
16	SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, "re-registration not required", 5GMM Cause set to #7 (5GS services not allowed) and the de-registration request is for non 3GPP access	<--	NR 5GMM: DEREGISTRATION REQUEST	-	-
17	Check: Does the UE transmit an DEREGISTRATION ACCEPT message?	-->	NR 5GMM: DEREGISTRATION ACCEPT	2	P
18	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
19	Check for 60 seconds if UE initiates Registration procedure	-	NR 5GMM: REGISTRATION REQUEST	2	F
20	The UE is switched off.	-	-	-	-
21	The UE is switched on.	-	-	-	-
22-31	The registration procedure is completed by executing steps 1-10 of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-3.	-	-	-	-
32	SS sends a DEREGISTRATION REQUEST message indicates no 5GMM cause IE, "re-registration not required", 5GMM Cause set to #72 (Non-3GPP access to 5GCN not allowed) and the de-registration request is for non 3GPP access	<--	NR 5GMM: DEREGISTRATION REQUEST	-	-
33	Check: Does the UE transmit an DEREGISTRATION ACCEPT message?	-->	NR 5GMM: DEREGISTRATION ACCEPT	3	P
34	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
35	Check for 60 seconds if UE initiates Registration procedure	-	NR 5GMM: REGISTRATION REQUEST	3	F
36	The UE is switched off.	-	-	-	-

9.2.6.2.2.3.3 Specific message contents

Table 9.2.6.2.2.3.3-1: Message DEREGISTRATION REQUEST (step 1, Table 9.2.6.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-12			
Information Element	Value/remark	Comment	Condition

De-registration type			
Switch off	'0'B	Normal de-registration	
Re-registration required	'0'B	re-registration not required	
Access type	'01'B	3GPP access	
5GMM cause	Not Present		

Table 9.2.6.2.2.3.3-2: Message REGISTRATION REQUEST (step 8, Table 9.2.6.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-6			
Information Element	Value/Remark	Comment	Condition
ngKSI			
NAS key set identifier	'111'B	no key is available (UE to network)	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111"	
5GS mobile identity	The valid SUCI		
Last visited registered TAI	Not present		

Table 9.2.6.2.2.3.3-2: Message ATTACH REQUEST (step 28, Table 9.2.6.2.2.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4			
Information Element	Value/remark	Comment	Condition
NAS key set identifier			
NAS key set identifier	'111'B	no key is available	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111".	
Old GUTI or IMSI	IMSI1		
Last visited registered TAI	Not present		

9.2.7 Service request

9.2.7.1 Service request / IDLE mode uplink user data transport / Rejected / Restricted service area, Abnormal / T3517

9.2.7.1.1 Test Purpose (TP)

Same test purposes as clause 9.1.7.1.1

9.2.7.1.2 Conformance requirements

Same conformance requirements as in clause 9.1.7.1.2



9.2.7.1.3

Test description

9.2.7.1.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state 3W-A with PDU session Active state according to TS 38.508-1 [4]

9.2.7.1.3.2 Test procedure sequence

Table 9.2.7.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
2	Trigger UE to initiate IPsec SA (Note 1)	-	-	-	-
-	Exception: In parallel to steps 3, the UE initiates an IPsec security association and one child security association as defined in TS 24.502 [35] clause 7.3.2	-	-	-	-
3	Check: Does UE transmit a SERVICE REQUEST message with Service type IE set to 'data'?	-->	SERVICE REQUEST	1	P
4	The SS transmits a SERVICE REJECT message with 5GMM cause = "Restricted service area ".	<--	SERVICE REJECT	-	-
5-6	Void.	-	-	-	-
6A	The SS starts timer 5 sec. Note: An arbitraty chosen timer to avoid message crossing.	-	-	-	-
-	EXCEPTION: Steps 6Ba1 to 6Bb3 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place if the UE is implemented in a certain way.	-	-	-	-
-	Exception: In parallel to steps 6Ba1 to 8B, the UE initiates an IPsec security association as defined in TS 24.502 [35] clause 7.3.2	-	-	-	-
6Ba1	Check: Does the UE transmit REGISTRATION REQUEST for mobility registration? NOTE: Allowed for Rel-15 UEs.	-->	REGISTRATION REQUEST	2	P
6Ba2	Stop timer 5 sec.	-	-	-	-
6Bb1	Timer 5 sec expires.	-	-	-	-
6Bb2	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
6Bb3	Check: Does the UE transmit REGISTRATION REQUEST for mobility registration over a new signalling connection?	-->	REGISTRATION REQUEST	2	P
7-8	Void.	-	-	-	-
8A	SS stops transmitting UL grant.	-	-	-	-
8B	SS sends a REGISTRATION ACCEPT message containing a 5G-GUTI.	<--	REGISTRATION ACCEPT	-	-
8C	SS trasnmits one UL grant, for the UE to transmit the REGISTRATION COMPLETE message at step 8D.	-	-	-	-
8D	The UE send a REGISTRATION COMPLETE.	-->	REGISTRATION COMPLETE	-	-

8E	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-	-	-	-
8F	The SS resumes UL grant transmission.	-	-	-	-
8G	The UE transmits a SERVICE REQUEST message over a new signalling connection.	-->	SERVICE REQUEST	-	-
8H	The SS does not respond to SERVICE REQUEST message. Note: The UE locally releases the signalling connection after T3517 expiry.	-	-	-	-
-	EXCEPTION: Steps 9 to 10 are repeated for 4 times.	-	-	-	-
9	Check: does the UE transmits a SERVICE REQUEST message after T3517 expiry but before 60s over a new signalling connection?	-->	SERVICE REQUEST	3	P
10	The SS does not respond to SERVICE REQUEST message. Note: The UE locally releases the signalling connection after T3517 expiry.	-->	SERVICE REQUEST	-	-
11	Check: Does the UE transmits a SERVICE REQUEST message within 60 seconds (minimum value of T3525) over a new signalling connection?	-->	SERVICE REQUEST	3,4	F
12	The SS starts timer 10 sec after Step 11 to see if UE performs the optional Steps listed below.	-	-	-	-
-	EXCEPTION: Steps 12a1 to 12a7a2 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place if the UE is implemented in a certain way.	-	-	-	-
12a1	Trigger UE to initiate IPsec SA (Note 1)	-	-	-	-
	Exception: In parallel to steps 12a2 to 12a5, the UE initiates an IPsec security association and one child security association as defined in TS 24.502 [35] clause 7.3.2	-	-	-	-
12a2	The UE transmits a SERVICE REQUEST message after T3525 expiry over a new signalling connection.	-->	SERVICE REQUEST	-	-
12a3-12a7a2	Steps 5 to 9a2 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are executed.	-	-	-	-
Note 1: This could be done by e.g. MMI or by AT command +CGACT.					

9.2.7.1.3.3 Specific message contents

Table 9.2.7.1.3.3-3: SERVICE REQUEST (steps 3, 8G and 9, Table 9.2.7.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-16			
Information Element	Value/remark	Comment	Condition
Service type			
Service type value	‘0001’B	data	

Table 9.2.7.1.3.3-4: SERVICE REJECT (step 4, Table 9.2.7.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-18			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0001 1100'B	Restricted service area	

9.2.7.2            Service request / CMM CONNECTED mode/uplink user data transport / Abnormal / T3517

9.2.7.2.1            Test Purpose (TP)

(1)

with { the UE is in 5GMM-REGISTERED state and 5GMM-CONNECTED mode over 3GPP access }  
  
ensure that {  
  
    when { the UE has user data pending due to no user-plane resources established for PDU session(s) used for user data transport }  
  
        then { the UE sends a SERVICE REQUEST message }  
  
            }  
  
}

(2)

with { the UE sends a SERVICE REQUEST message in 5GMM-CONNECTED mode }  
  
ensure that {  
  
    when { T3517 expired }  
  
        then { the UE stays in 5GMM-CONNECTED mode }  
  
            }  
  
}

9.2.7.2.2            Conformance requirements

Same conformance requirements as in clause 9.1.7.2.2

9.2.7.2.3            Test description

9.2.7.2.3.1            Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state 3W-A with PDU session (with PDU session ID X where 1 <= X <= 15) Active state according to TS 38.508-1 [4]

9.2.7.2.3.2 Test procedure sequence

Table 9.2.7.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		
1	The SS initiated child SA deletion procedure sec tunnel as defined in TS 24.502 [33] clause 7.7.2	-	-	-	-
2	Trigger UE to send a ICMP ECHO REQUEST (pc_IPv4 = TRUE)_or ICMPv6 ECHO REQUEST (pc_IPv6 = TRUE) (Note 2)	-	-	-	-
3	The UE transmits a SERVICE REQUEST message.	-->	NR 5GMM: SERVICE REQUEST	1	P
4	The SS does not respond to the <i>SERVICE REQUEST</i> message.	-	-	-	-
5	Wait for T3517 seconds (Note 1).	-	-	-	-
6	The UE transmit a <i>SERVICE REQUEST</i> message.	-->	NR 5GMM: <i>SERVICE REQUEST</i>	-	-
7	The SS sends an IDENTITY REQUEST message.	<--	NR 5GMM: IDENTITY REQUEST	-	-
8	Check: Does the UE transmit an IDENTITY RESPONSE message?	-->	NR 5GMM: IDENTITY RESPONSE	2	P
-	Exception: In parallel to steps 9, the SS initiates one child security association as defined in TS 24.502 [33] clause 7.5	-	-	-	-
9	The SS transmits SERVICE ACCEPT message to setup User-plane resources for the PDU session X.	<--	NR 5GMM: SERVICE ACCEPT		
-	EXCEPTION: Steps 10a1 to 10b2 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation.	-	-	-	-
10a1	IF (pc_IPv4 = TRUE) THEN, check that the UE sends an ICMP Echo request to the SS?	-->	<i>ICMP ECHO REQUEST</i>	1	P
10a2	The SS sends an ICMP Echo reply	<--	<i>ICMP ECHO REPLY</i>	-	
10b1	ELSE IF (pc_IPv4 = FALSE AND pc_IPv6 = TRUE) THEN, check the UE sends an ICMPv6 Echo request to the SS?	-->	<i>ICMPv6 ECHO REQUEST</i>	1	P
10b2	The SS sends an ICMPv6 Echo reply	<--	<i>ICMPv6 ECHO REPLY</i>	-	-
Note 1: T3517 expires after 15 seconds.					
Note 2: This could be done by a MMI command					

9.2.7.2.3.3 Specific message contents

Table 9.2.7.2.3.3-1: SERVICE REQUEST (step 3, 6, Table 9.2.7.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-16			
Information Element	Value/Remark	Comment	Condition

Service type	'0001'B	data	
Uplink data status			
PSI(X)	'1'B	PSI(X) is set to 1 indicates that uplink data are pending for the PDU session X activated in preamble.	

Table 9.2.7.2.3.3-2: IDENTITY REQUEST (step 7, Table 9.2.7.2.3.2-1)

Derivation Path: TS 38.508-1 [4] table 4.7.1-21			
Information Element	Value/remark	Comment	Condition
Identity type	'0010'B	5G-GUTI	

Table 9.2.7.2.3.3-3: IDENTITY RESPONSE (step 8, Table 9.2.7.2.3.2-1)

Derivation Path: TS 38.508-1 [4] table 4.7.1-22			
Information Element	Value/remark	Comment	Condition
Mobile identity	5G-GUTI		

Table 9.2.7.2.3.3-4: SERVICE ACCEPT (step 9, Table 9.2.7.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-17			
Information Element	Value/Remark	Comment	Condition
PDU session reactivation result			
PSI(X)	'0'B	PSI(X) is set to 0 indicates that establishment of user-plane resource of the PDU session X activated in preamble is successful.	

## 9.2.8 SMS over NAS

### 9.2.8.1 SMS over NAS / MO SMS over NAS - 5GMM-Idle mode

#### 9.2.8.1.1 Test Purpose (TP)

(1)

with { the UE in switched off state with valid USIM inserted }

ensure that {

    when { the UE requests initial registration for SMS over NAS }

```
    then { the UE shall send REGISTRATION REQUEST message with SMS requested bit of the 5GS
registration type IE "SMS over NAS supported" }

}
```

(2)

```
with { the UE in 5GMM_Connected state with 5GMM-Idle mode and the UE has sent a SERVICE REQUEST
message triggered by initiating MO SMS}

ensure that {

    when { UE receives a SERVICE ACCEPT message from SS }

        then { UE sends CP-DATA containing RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS
transport message }

}
```

(3)

```
with { UE has sent CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink
NAS transport message }

ensure that {

    when { UE receives a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport
message }

        then { UE sends a CP-ACK encapsulated in an Uplink NAS Transport message }
```

9.2.8.1.2 Conformance requirements

Same conformance requirements as in clause 9.2.8.1.2

9.2.8.1.3 Test description

9.2.8.1.3.1 Pre-test conditions

System Simulator:

WLAN Cell 27;

UE:

The UE does not have any stored SMS message.

Preamble:

The UE is in state Switched OFF (state-0W-B) according to TS 38.508-1 [4].

9.2.8.1.3.2 Test procedure sequence

Table 9.2.8.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
1	The UE is switched ON	-	-	-	-
2-3	Steps 1-2 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-
-	Exception: The UE establishes an IPsec tunnel in parallel to 5GC registration steps 4 to 8 as per the IKEv2 protocol as defined in 3GPP TS 23.502 [31] clause 4.12.2.2 figure 4.12.2.2-1.	-	-	-	-
4	Check: Does UE transmit a REGISTRATION REQUEST message including 5GS update type IE with SMS requested bit set to "SMS over NAS supported"?	-->	REGISTRATION REQUEST	1	P
5 - 8	Steps 4-5 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-
9	SS transmits REGISTRATION ACCEPT message including 5GS registration result with SMS allowed bit set to "SMS over NAS allowed".	<--	REGISTRATION ACCEPT	-	-
10 -12	Steps 9-11 of the generic procedure for UE registration specified in TS 38.508-1 [4] table 4.5.2.2-3 are performed.	-	-	-	-
13	Sending of a 160 character MO SMS is initiated at the UE via MMI or AT command	-	-	-	-
14	UE transmits establishes a IPSEC SA and NAS signalling connection as per generic procedure in table 4.5A.4.2.2-1 of 38.508-1 [4]".	-	-	-	-
15	Check: Does the UE transmit a CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink NAS transport message?	-->	UPLINK NAS TRANSPORT	2	P
16	The SS transmits a CP-ACK encapsulated in a Downlink NAS Transport message.	<--	DOWNLINK NAS TRANSPORT	-	-
17	The SS transmits a CP-DATA containing an RP-ACK RPDU encapsulated in a Downlink NAS transport message	<--	DOWNLINK NAS TRANSPORT	-	-
18	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS Transport message?	-->	UPLINK NAS TRANSPORT	3	P

9.2.8.1.3.3 Specific message contents

Table 9.2.8.1.3.3-1: REGISTRATION REQUEST (step 4, Table 9.2.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition



5GS registration type			
5GS registration type value	'001'B		INITIAL
5GS update type			
SMS requested	SMS over NAS supported		

Table 9.2.8.1.3.3-2: REGISTRATION ACCEPT (step 9, Table 9.2.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS registration result			
SMS allowed	SMS over NAS allowed		
T3512 value			
Timer value	'00011'B		
Unit	'101'B		

Table 9.2.8.1.3.3-3: UL NAS TRANSPORT (step 15, Table 9.2.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-DATA RPDU	

Table 9.2.8.1.3.3-3a:Message CP-DATA (step 15, Table 9.2.8.1.3.2-1)

Information Element	Value/remark	Comment	Condition
CP-User data	RP-DATA		

Table 9.2.8.1.3.3-4: DL NAS TRANSPORT (step 16, Table 9.2.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

Table 9.2.8.1.3.3-5: DL NAS TRANSPORT (step 17, Table 9.2.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-11			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-DATA	RP-ACK RPDU	

Table 9.2.8.1.3.3-5a:Message CP-DATA (step 17, Table 9.2.8.1.3.2-1)

Information Element	Value/remark	Comment	Condition
CP-User data	RP-DATA		

Table 9.2.8.1.3.3-6: UL NAS TRANSPORT (step 18, Table 9.2.8.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0010'B	SMS	
Payload container	CP-ACK		

## 9.3 Inter-system mobility

### 9.3.1 5GS-EPC Inter-system mobility

#### 9.3.1.1 Inter-system mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / 5GC to EPC

##### 9.3.1.1.1 Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED and 5GMM-IDLE on a 5GC NR cell and has been previously registered on EPC as well, UE supporting S1 and N1 and operating in single-registration mode, NWK supporting Single-registration mode with N26 interface }

ensure that {

when { UE detects a suitable EPC E-UTRA cell after the serving NGC cell becomes not suitable }

then { UE performs a Inter-system change from N1 mode to S1 mode by initiating and successfully completing a TAU procedure, mapped EPC context used }

}

##### 9.3.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 5.1.4.2; TS 24.301 [21], subclause 4.4.2.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 5.1.4.2]

At Inter-system change from N1 mode to S1 mode when there is at least one active PDU session for which interworking with EPS is supported as specified in subclause 6.1.4.1, the UE shall enter sub states EMM-REGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE and initiate a tracking area updating procedure (see 3GPP TS 24.301 [15]).

[TS 24.301, subclause 4.4.2.3]

During Inter-system change from N1 mode to S1 mode in 5GMM-IDLE mode, if the UE is operating in the single-registration mode and:

- 1) if the tracking area updating procedure is initiated as specified in 3GPP TS 24.501 [54], the UE shall transmit a TRACKING AREA UPDATE REQUEST message integrity protected with the current 5G NAS security context and the UE shall derive a mapped EPS security context (see subclause 8.6.1 of 3GPP TS 33.501 [56]). The UE shall include the eKSI indicating the 5G NAS security context value in the TRACKING AREA UPDATE REQUEST message.

After receiving the TRACKING AREA UPDATE REQUEST message including the eKSI, the MME forwards the TRACKING AREA UPDATE REQUEST message to the source AMF, if possible, to obtain the mapped EPS security context from the AMF as specified in 3GPP TS 33.501 [56]. The MME re-establishes the secure exchange of NAS messages by either:

- replying with a TRACKING AREA UPDATE ACCEPT message that is integrity protected and ciphered using the mapped EPS NAS security context. From this time onward, all NAS messages exchanged between the UE and the MME are sent integrity protected and except for the messages specified in subclause 4.4.5, all NAS messages exchanged between the UE and the MME are sent ciphered; or

9.3.1.1.3

Test description

9.3.1.1.3.1

Pre test conditions

System Simulator:

- 2 cells
- NGC Cell A as defined in TS 38.508-1 [4] Table 6.3.2.2-1. System information combination NR-6 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2.
- E-UTRA Cell A as defined in TS 36.508 [7] Table 6.3.2.2-1. System information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.

UE:

- None.

Preamble:

- With E-UTRA Cell A "Serving cell" and NGC Cell A "Non-suitable "Off" cell", the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established
- the UE is switched-off
- With NGC Cell A "Serving cell" and E-UTRA Cell A "Non-suitable "Off" cell", the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

9.3.1.1.2

Test procedure sequence

Table 9.3.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The SS configures: - E-UTRA Cell A as "Serving cell" - NGC Cell A as "Non-suitable "off" cell".	-	-	-	-
2	Check: Does the UE perform on the E-UTRA Cell A the TAU procedure for Inter-system change from N1 mode to S1 mode in 5GMM/EMM-IDLE mode as described in TS 38.508-1 [4], Table 4.9.7.2.2-1, 'connected without release'?	-	-	1	-

9.3.1.1.3.3

Specific message contents

None.

9.3.1.2

Inter-system mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / EPC to 5GC

9.3.1.2.1

Test Purpose (TP)

(1)

with { UE in state EMM-REGISTERED and EMM-IDLE on an E-UTRA cell and has been previously registered on 5GC, UE supporting S1 and N1 and operating in single-registration mode, NWK supporting Single-registration mode with N26 interface }

ensure that {

    when { UE detects a suitable NGC cell after the serving E-UTRA cell becomes not suitable }  
  
    then { UE performs a Inter-system change from S1 mode to N1 mode by initiating and successfully completing a mobility and periodic registration update procedure, mapped 5GC context used }  
  
}

9.3.1.2.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclauses 4.4.2.1, 4.4.2.5, 5.1.4.2, 5.5.1.3.2; TS 24.301 [21], subclause 5.5.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 4.4.2.1]

Before security can be activated, the AMF and the UE need to establish a 5G NAS security context. Usually, the 5G NAS security context is created as the result of a primary authentication and key agreement procedure between the AMF and the UE. A new 5G NAS security context may also be created during an N1 mode to N1 mode handover. Alternatively, during inter-system change from S1 mode to N1 mode, the AMF not supporting interworking without N26 and the UE operating in single-registration mode may derive a mapped 5G NAS security context from an EPS security context that has been established while the UE was in S1 mode.

...

The key set identifier ngKSI is assigned by the AMF either during the primary authentication and key agreement procedure or, for the mapped 5G NAS security context, during the inter-system change. The ngKSI consists of a value and a type of security context parameter indicating whether a 5G NAS security context is a native 5G NAS security context or a mapped 5G NAS security context. When the 5G NAS security context is a native 5G NAS security context,

the ngKSI has the value of  $KSI_{AMF}$ , and when the current 5G NAS security context is of type mapped, the ngKSI has the value of  $KSI_{ASME}$ .

The 5G NAS security context which is indicated by an ngKSI can be taken into use to establish the secure exchange of NAS messages when a new N1 NAS signalling connection is established without executing a new primary authentication and key agreement procedure (see subclause 5.4.1) or when the AMF initiates a security mode control procedure. For this purpose, the initial NAS messages (i.e. REGISTRATION REQUEST, DEREGISTRATION REQUEST, SERVICE REQUEST and CONTROL PLANE SERVICE REQUEST) and the SECURITY MODE COMMAND message contain an ngKSI in the NAS key set identifier IE indicating the current 5G NAS security context used to integrity protect the NAS message.

[TS 24.501, subclause 4.4.2.5]

Secure exchange of NAS messages via a NAS signalling connection is usually established by the AMF during the registration procedure by initiating a security mode control procedure. After successful completion of the security mode control procedure, all NAS messages exchanged between the UE and the AMF are sent integrity protected using the current 5G security algorithms, and except for the messages specified in subclause 4.4.5, all NAS messages exchanged between the UE and the AMF are sent ciphered using the current 5G security algorithms.

...

During inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, if the UE is operating in single-registration mode and:

- ...b) if the UE has no valid native 5G NAS security context, the UE shall send the REGISTRATION REQUEST message without integrity protection and encryption.

After receiving the REGISTRATION REQUEST message without integrity protection and encryption:

- 1) if N26 interface is supported:
  - i) if an EPS security context received from the source MME does not include the NAS security algorithms set to EIA0 and EEA0, the AMF shall either create a fresh mapped 5G NAS security context (see subclause 8.6.2 of 3GPP TS 33.501 [24]) or trigger a primary authentication and key agreement procedure to create a fresh native 5G NAS security context; or

...

The newly created 5G NAS security context is taken into use by initiating a security mode control procedure and this context becomes the current 5G NAS security context in both the UE and the AMF. This re-establishes the secure exchange of NAS messages.

[TS 24.501, subclause 5.1.4.2]

At inter-system change from S1 mode to N1 mode, the UE shall enter sub states 5GMM-REGISTERED.NORMAL-SERVICE and EMM-REGISTERED.NO-CELL-AVAILABLE and initiate a registration procedure for mobility and periodic registration update indicating "mobility registration updating" in the 5GS registration type IE of the REGISTRATION REQUEST message (see subclause 5.5.1.3).

[TS 24.501, subclause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

...

- e) upon Inter-system change from S1 mode to N1 mode;

...

If case b) is the only reason for initiating the registration procedure for mobility and periodic registration update, the UE shall indicate "periodic registration updating" in the 5GS registration type IE; otherwise the UE shall indicate "mobility registration updating".

If the UE indicates "mobility registration updating" in the 5GS registration type IE and the UE supports S1 mode, the UE shall:

- set the S1 mode bit to "S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;
- include the S1 UE network capability IE in the REGISTRATION REQUEST message; and
- if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode, set the HO attach bit to "attach request message containing PDN connectivity request with request type set to handover to transfer PDU session from N1 mode to S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

...

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

The UE shall handle the 5GS mobility identity IE in the REGISTRATION REQUEST message as follows:

- a) if the UE is operating in the single-registration mode, performs Inter-system change from S1 mode to N1 mode, and the UE holds a valid 4G-GUTI, the UE shall include the 5G-GUTI mapped from the 4G-GUTI as specified in 3GPP TS 23.003 [4] in the 5GS mobility identity IE. Additionally, if the UE holds a valid 5G-GUTI, the UE shall include the 5G-GUTI in the Additional GUTI IE in the REGISTRATION REQUEST message in the following order:
  - 1) a valid 5G-GUTI that was previously assigned by the same PLMN with which the UE is performing the registration, if available;
  - 2) a valid 5G-GUTI that was previously assigned by an equivalent PLMN, if available; and
  - 3) a valid 5G-GUTI that was previously assigned by any other PLMN, if available; and

...

If the UE operating in the single-registration mode performs Inter-system change from S1 mode to N1 mode, the UE:

- a) shall include the UE status IE with the EMM registration status set to "UE is in EMM-REGISTERED state" in the REGISTRATION REQUEST message;

NOTE 1: Inclusion of the UE status IE with this setting corresponds to the indication that the UE is "moving from EPC" as specified in 3GPP TS 23.502 [9], subclause 4.11.1.3.3 and 4.11.2.3.

- b) may include the PDU session status IE in the REGISTRATION REQUEST message indicating the status of the PDU session(s) mapped during the Inter-system change from S1 mode to N1 mode from the PDN connection(s) for which the EPS indicated that interworking to 5GS is supported, if any (see subclause 6.1.4.1); and
- c) shall include a TRACKING AREA UPDATE REQUEST message as specified in 3GPP TS 24.301 [15] in the IE in the REGISTRATION REQUEST message.

...

The UE shall send the REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6:

...

- b) when the UE is sending the message after an Inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode and the UE has a valid 5G NAS security context and needs to send non-cleartext IEs.

[TS 24.301, subclause 5.5.5]

The tracking area updating procedure is used to construct a TRACKING AREA UPDATE REQUEST message for the inter-system change from S1 mode to N1 mode for further security verification by the MME.

The TRACKING AREA UPDATE REQUEST message is created by EMM by request of 5GMM which further includes the message in the REGISTRATION REQUEST message as described in 3GPP TS 24.501 [54].

The TRACKING AREA UPDATE REQUEST message shall contain only mandatory information elements.

The UE shall set the EPS update type IE in the TRACKING AREA UPDATE REQUEST message to "TA updating".

If the UE has a current EPS security context, the UE shall include the eKSI (either KSI<sub>ASME</sub> or KSI<sub>SGSN</sub>) in the NAS Key Set Identifier IE in the TRACKING AREA UPDATE REQUEST message. Otherwise, the UE shall set the NAS Key Set Identifier IE to the value "no key is available". If the UE has a current EPS security context, the UE shall integrity protect the TRACKING AREA UPDATE REQUEST message with the current EPS security context and increase the uplink NAS COUNT by one. Otherwise the UE shall not integrity protect the TRACKING AREA UPDATE REQUEST message. The UE shall set associated GUTI in the Old GUTI IE.

When the UE is in EMM-REGISTERED.NO-CELL-AVAILABLE substate and needs to construct the TRACKING AREA UPDATE REQUEST message for inter-system change from S1 mode to N1 mode, the UE shall consider that the tracking area updating procedure is not initiated and the UE shall remain in EMM-REGISTERED.NO-CELL-AVAILABLE state.

**9.3.1.2.3                    Test description**

**9.3.1.2.3.1                Pre test conditions**

**System Simulator:**

- 2 cells
- NGC Cell A as defined in TS 38.508-1 [4] Table 6.3.2.2-1. System information combination NR-6 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2.
- E-UTRA Cell A as defined in TS 36.508 [7] Table 6.3.2.2-1. System information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.

**UE:**

None.

**Preamble:**

- With NGC Cell A "Serving cell" and E-UTRA Cell A "Non-suitable "Off" cell", the UE is switched on and when it initiates the initial registration procedure then it is rejected as specified in subclause 4.9.8 Procedure for Registration Reject.This is made to ensure that the UE does not have a valid native 5G NAS security context for the rest of the test case.
- the UE is switched-off

- With E-UTRA Cell A "Serving cell" and NGC Cell A "Non-suitable "Off" cell", the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-5. 4G GUTI and eKSI are assigned and security context established

9.3.1.2.3.2            Test procedure sequence

Table 9.3.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS configures: - NGC Cell A as "Serving cell" - E-UTRA Cell A as "Non-suitable "off" cell".	-	-	-	-
2	Check: Does the UE perform on the NGC Cell A the Test procedure for UE Tracking area updating for Inter-system change from S1 mode to N1 mode in 5GMM/EMM-IDLE mode as described in TS 38.508-1 [4], Table 4.9.9.2.2-1 with the exception that the SS does not initiate the primary authentication and key agreement procedure desccribed in steps 4-5 (NOTE 1), ' <i>connected without release</i> '?	-	-	1	-
NOTE 1: This is required to allow for the verification of the UE using mapped 5GC context as per TP1.					

9.3.1.2.3.3            Specific message contents

Table 9.3.1.2.3.3-1: REGISTRATION REQUEST (Preamble; TS 38.508-1 [4], Table 4.5.2.2-2)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GMM capability	'0000 0xx1'	S1 mode supported  x - not checked	
S1 UE network capability			
All octets with the exception of octet 9, bit 6	Not checked		
N1 mode supported (N1mode) (octet 9, bit 6)	'1'	N1 mode supported	

Table 9.3.1.2.3.3-2: REGISTRATION REJECT (Preamble; step 8, TS 38.508-1 [4], Table 4.9.8.2.2-1)

Derivation path: TS 38.508-1 [4], Table 4.9.8.2.3-1			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0000 0011'B	Illegal UE	



Table 9.3.1.2.3.3-3: Message ATTACH REQUEST (Preamble; step 4, TS 38.508-1 [4], Table 4.5.2.2-5)

Derivation Path: TS 36.508 [7], Table 4.7.2-4 with condition NR			
Information Element	Value/remark	Comment	Condition
NAS key set identifier			
NAS key set identifier	'111'B	no key is available	
TSC	Any allowed value	TSC does not apply for NAS key set identifier value "111".	
Old GUTI or IMSI	IMSI1		
Last visited registered TAI	Not present		

Table 9.3.1.2.3.3-4: REGISTRATION REQUEST (step 2, Table 9.3.1.2.3.2-1; step 1, TS 38.508-1 [4] Table 4.9.9.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6 with condition Not_Registered_Previously_on_5GCN.
---

Table 9.3.1.2.3.3-5: TRACKING AREA UPDATE REQUEST (9.3.1.2.3.3-3)

Derivation path: TS 38.508-1 [4], Table 4.9.9.2.3-2			
Information Element	Value/remark	Comment	Condition
NAS key set identifier			
NAS key set identifier	the eKSI for the current EPS security context		
TSC	'0'B	native (current) EPS security context	

Table 9.3.1.2.3.3-6: SECURITY MODE COMMAND (step 2, Table 9.3.1.2.3.2-1; step 6, TS 38.508-1 [4] Table 4.9.9.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-25.			
Information Element	Value/remark	Comment	Condition
ngKSI			
NAS key set identifier	KSI <sub>ASME</sub> that was created when the UE last registered to EPS		
TSC	'1'B	mapped security context (for KSI <sub>ASME</sub> )	

9.3.1.3 Inter-system mobility and periodic registration update / Rejected / Single-registration mode with N26 / Handling of EPC relevant parameters

9.3.1.3.1 Test Purpose (TP)

(1)

with { UE in state 5GMM-REGISTERED on an NGC cell, UE supporting S1 and N1 and operating in single-registration mode, NWK supporting Single-registration mode with N26 interface }

ensure that {

```
    when { UE initiates a Mobility and periodic registration procedure on an NGC cell and receives a
REGISTRATION REJECT message including 5GMM cause value #9 (UE identity cannot be derived by the
network) }

    then { UE deletes the EPS relevant parameters 4G-GUTI, last visited registered TAI and eKSI and
enters the state EMM-DEREGISTERED, and, subsequently, when it finds a suitable E-UTRA cell it moves
to it and automatically initiates an attach procedure }

}
```

**9.3.1.3.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 5.5.1.3.5, TS 24.301 [21], clause 5.5.3.2.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 5.5.1.3.5]

If the mobility and periodic registration update request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

#9 (UE identity cannot be derived by the network).

...

If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the normal tracking area updating procedure is rejected with the EMM cause with the same value.

[TS 24.301, subclause 5.5.3.2.5]

If the tracking area updating cannot be accepted by the network, the MME sends a TRACKING AREA UPDATE REJECT message to the UE including an appropriate EMM cause value.

...

#9 (UE identity cannot be derived by the network);

The UE shall set the EPS update status to EU2 NOT UPDATED (and shall store it according to subclause 5.1.3.3) and shall delete any GUTI, last visited registered TAI, TAI list and eKSI. The UE shall enter the state EMM-DEREGISTERED.

If the rejected request was not for initiating a PDN connection for emergency bearer services, the UE shall subsequently, automatically initiate the attach procedure.

**9.3.1.3.3 Test description**

**9.3.1.3.3.1 Pre test conditions**

**System Simulator:**

- 2 cells
- NGC Cell A as defined in TS 38.508-1 [4] Table 6.3.2.2-1. System information combination NR-6 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2.

- E-UTRA Cell A as defined in TS 36.508 [7] Table 6.3.2.2-1. System information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.

UE:

None.

Preamble:

- With E-UTRA Cell A "Serving cell" and NGC Cell A "Non-suitable "Off" cell", the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established
- the UE is switched-off
- With NGC Cell A "Serving cell" and E-UTRA Cell A "Non-suitable "Off" cell", the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

9.3.1.3.3.2

Test procedure sequence

Table 9.3.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Wait for 25 seconds (expiry of T3512 periodic registration update timer, the value of 30 sec is provided during the initial registration in the Preamble).	-	-	-	-
2	The UE transmit a REGISTRATION REQUEST message with the 5GS registration type IE indicating "periodic registration updating".	-->	REGISTRATION REQUEST	-	-
3	The SS configures: - E-UTRA Cell A "Suitable neighbour inter-frequency cell".	-	-	-	-
4	The SS transmits a REGISTRATION REJECT message including 5GMM cause value #9 (UE identity cannot be derived by the network).	<--	REGISTRATION REJECT	-	-
4A	The SS configures: - NGC Cell A as "Non-Suitable "Off" cell".	-	-	-	-
5	Check: Does the UE perform on the E-UTRA Cell A an attach procedure as described in TS 38.508-1 [4], Table 4.5.2.2-1? The UE does not provide 4G-GUTI or 4G eKSI; nor last visited registered TAI.	-	-	1	-

9.3.1.3.3.3

Specific message contents

Table 9.3.1.3.3.3-1: REGISTRATION ACCEPT (Preamble; TS 38.508-1 [4] Table 4.5.2.2-2)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

T3512 value			
Unit	'100'B	value is incremented in multiples of 30 seconds	
Timer value	'0 0001'B	30 seconds	

Table 9.3.1.3.3.3-2: REGISTRATION REQUEST (step 2, Table 9.3.1.3.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6.			
Information Element	Value/remark	Comment	Condition
5GS registration type	'00xxx011'	periodic registration updating  x - not checked	
ngKSI	Active ngKSI assigned in the Preamble		
5GS mobile identity	Active 5G-GUTI assigned in the Preamble		
Last visited registered TAI	The TAI of the NGC Cell A, see TS 38.508-1 [4] Table 6.3.2.2-1		

Table 9.3.1.3.3.3-3: REGISTRATION REJECT (step 4, Table 9.3.1.3.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9.			
Information Element	Value/remark	Comment	Condition
5GMM cause	'0000 1001'B	#9 - UE identity cannot be derived by the network	

Table 9.3.1.3.3.3-4: ATTACH REQUEST (step 5, Table 9.3.1.3.3.2-1; step 5, TS 38.508-1 [4] Table 4.5.2.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4.			
Information Element	Value/remark	Comment	Condition
NAS key set identifier	'111'	no key is available	
EPS mobile identity	IMSI		
Old P-TMSI signature	Not present		
Last visited registered TAI	Not present		
Old location area identification	Not checked		
Old GUTI type	Not present		

# 10 Session management

## 10.1 5GS session management

Editor’s note: Intended to capture tests of 5G Core Network behaviour defined in TS 24.301, TS 24.501 et.al. (TR 24.890).

FFS.

**10.1.1 PDU session authentication and authorization**

**10.1.1.1 PDU session authentication and authorization / during the UE-requested PDU session procedure**

**10.1.1.1.1 Test Purpose (TP)**

**(1)**

**with** { UE is establishing UE-requested PDU session by sending PDU Session establishment Request message }  
  
**ensure that** {  
  
    **when** { UE receives a PDU SESSION AUTHENTICATION COMMAND message }  
  
        **then** { UE transmits a PDU SESSION AUTHENTICATION COMPLETE message }  
  
    }

**(2)**

**with** { PDU session authentication and authorization procedure is performed during the UE-requested PDU session establishment procedure }  
  
**ensure that** {  
  
    **when** { UE receives EAP-failure message in the PDU SESSION ESTABLISHMENT REJECT message }  
  
        **then** { UE consider that the PDU session is not established }  
  
    }

**(3)**

**with** { PDU session authentication and authorization procedure is performed during the UE-requested PDU session establishment procedure }  
  
**ensure that** {  
  
    **when** { UE receives EAP-success message in the PDU SESSION ESTABLISHMENT ACCEPT message }  
  
        **then** { UE consider that the PDU session is established }  
  
    }

**10.1.1.1.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 6.3.1.2.1, 6.3.1.2.2 and 6.4.1.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 6.3.1.2.1]

In order to initiate the PDU EAP message reliable transport procedure, the SMF shall create a PDU SESSION AUTHENTICATION COMMAND message.

The SMF shall set the PTI IE of the PDU SESSION AUTHENTICATION COMMAND message to "No procedure transaction identity assigned".

The SMF shall set the EAP message IE of the PDU SESSION AUTHENTICATION COMMAND message to the EAP-request message provided by the DN or generated locally.

The SMF shall send the PDU SESSION AUTHENTICATION COMMAND message, and the SMF shall start timer T3590 (see example in figure 6.3.1.1).

Upon receipt of a PDU SESSION AUTHENTICATION COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE passes to the upper layers the EAP message received in the EAP message IE of the PDU SESSION AUTHENTICATION COMMAND message. Apart from this action, the authentication and authorization procedure initiated by the DN is transparent to the 5GSM layer of the UE.

[TS 24.501 clause 6.3.1.2.2]

When the upper layers provide an EAP-response message responding to the received EAP-request message, the UE shall create a PDU SESSION AUTHENTICATION COMPLETE message.

The UE shall set the EAP message IE of the PDU SESSION AUTHENTICATION COMPLETE message to the EAP-response message.

The UE shall transport the PDU SESSION AUTHENTICATION COMPLETE message and the PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5. Apart from this action, the authentication and authorization procedure initiated by the DN is transparent to the 5GSM layer of the UE.

Upon receipt of a PDU SESSION AUTHENTICATION COMPLETE message, the SMF shall stop timer T3590 and provides the EAP message received in the EAP message IE of the PDU SESSION AUTHENTICATION COMPLETE message to the DN or handles it locally.

[TS 24.501 clause 6.4.1.4]

If the connectivity with the requested DN is rejected by the network, the SMF shall create a SM PDU SESSION ESTABLISHMENT REJECT message.

The SMF shall set the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message to indicate the reason for rejecting the PDU session establishment.

The 5GSM cause IE typically indicates one of the following SM cause values:

- #8 operator determined barring;
- #26 insufficient resources;
- #27 missing or unknown DNN;
- #28 unknown PDU session type;
- #29 user authentication or authorization failed;

10.1.1.1.3	Test description
10.1.1.1.3.1	Pre-test conditions

System Simulator:  
NGC Cell A

UE:

None.

Preamble:

The UE is in state 1N-A with PDU session Active state using the generic procedure NR RRC\_IDLE according to TS 38.508-1 [4].

10.1.1.1.3.2

Test procedure sequence

Table 10.1.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	Cause the UE to request connectivity to an additional PDU session. (see Note 1)	-	-	-	-
2-2A	Steps 2-3 of the generic procedure for NR RRC_Connected specified in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
2B	The UE transmits an <i>RRCSetupComplete</i> message and a SERVICE REQUEST message with service type IE set to "signalling".	-->	SERVICE REQUEST	-	-
3-3A	Steps 5 and 6 of the generic procedure for NR RRC_Connected specified in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
4	The SS transmits an <i>RRCReconfiguration</i> message and a SERVICE ACCEPT message to establish SRB2 and DRB.	<--	NR RRC: RRCReconfiguration 5GMM: SERVICE ACCEPT	-	-
4A	The UE transmits an <i>RRCReconfigurationComplete</i> message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
5	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session.  Note: PDU SESSION ESTABLISHMENT REQUEST is included in UL NAS transport. UL NAS transport message is included in dedicatedNAS-Message of <i>ULInformationTransfer</i> message. DNN information is included in UL NAS transport message.	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	-	-
6	The SS transmits PDU SESSION AUTHENTICATION COMMAND including an EAP-Request message.	<--	PDU SESSION AUTHENTICATION COMMAND		
7	Check: Does the UE transmit a PDU SESSION AUTHENTICATION COMPLETE containing EAP-Response message?	-->	PDU SESSION AUTHENTICATION COMPLETE	1	P
8	The SS transmits PDU SESSION ESTABLISHMENT REJECT message with 5GSM cause #29 including an EAP-Failure message.	<--	PDU SESSION ESTABLISHMENT REJECT		
9	The SS releases the RRC connection.	-	-	-	-
10	Cause the UE to request connectivity to an additional PDU session. (see Note 1)	-	-	-	-
11-11A	Steps 2-3 of the generic procedure for NR RRC_Connected specified in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
11B	The UE transmits an <i>RRCSetupComplete</i> message and a SERVICE REQUEST message with service type IE set to "signalling".	-->	SERVICE REQUEST	-	-
12-12A	Steps 5 and 6 of the generic procedure for NR RRC_Connected specified in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
13	The SS transmits an <i>RRCReconfiguration</i> message and a SERVICE ACCEPT message to establish SRB2 and DRB.	<--	NR RRC: RRCReconfiguration 5GMM: SERVICE ACCEPT	-	-
13A	The UE transmits an <i>RRCReconfigurationComplete</i> message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
14	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session.  Note: PDU SESSION ESTABLISHMENT	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	2	P



	REQUEST is included in UL NAS transport. UL NAS transport message is included in dedicatedNAS-Message of <i>ULInformationTransfer</i> message DNN information is included in UL NAS transport message.				
15	The SS transmits PDU SESSION AUTHENTICATION COMMAND including an EAP-Request message.	<--	PDU SESSION AUTHENTICATION COMMAND		
16	Check: Does the UE transmit a PDU SESSION AUTHENTICATION COMPLETE containing EAP-Response message?	-->	PDU SESSION AUTHENTICATION COMPLETE	-	-
17	The SS transmits <i>RRCReconfiguration</i> message containing PDU SESSION ESTABLISHMENT ACCEPT message containing an EAP-Success message.	<--	PDU SESSION ESTABLISHMENT ACCEPT		
18	The UE transmits <i>RRCReconfigurationComplete</i> message to confirm the establishment of DRB.	-	-	3	P
-	EXCEPTION: Step 19a1 describes behaviour depending UE implementation; the "lower case letter" identifies a step sequence that take place if the UE performs a specific action.	-	-	-	-
19a1	If initiated by the UE, the generic procedure for IP address allocation in the user plane, specified in subclause 4.5.6, takes place performing IP address allocation in the user plane.	-	-	-	-
20	The SS releases the RRC connection.	-		-	-
Note 1: The request of connectivity to an additional PDU session may be performed by MMI or AT command +CGACT.					

10.1.1.1.3.3 Specific message contents

Table 10.1.1.1.3.3-1: SERVICE REQUEST (step 2B and 11B, Table 10.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-16			
Information Element	Value/remark	Comment	Condition
Service type	'0000'B	signalling	
PDU session status	PDU session IDs	PDU session IDs of the ACTIVE PDU session established during Preamble.	

Table 10.1.1.1.3.3-2: SERVICE ACCEPT (step 4 and 13, Table 10.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-17			
Information Element	Value/remark	Comment	Condition
PDU session status	PDU session IDs	PDU session IDs of the ACTIVE PDU session established during Preamble.	

Table 10.1.1.1.3.3-3: PDU SESSION ESTABLISHMENT REQUEST (step 5 and 14, Table 10.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.2-1			
Information Element	Value/remark	Comment	Condition
PDU session ID	PSI-1	UE assigns a particular PSI not yet used between 1 and 15	
PTI	PTI-1	UE assigns a particular PTI not yet used between 1 and 254	

Table 10.1.1.1.3.3-4: UL NAS Transport (step 5 and 14, Table 10.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0001'B	N1 SM information	
PDU session ID	PSI-1		
Request type	'001'B	Initial request	
S-NSSAI	Not Present		
DNN	DNN-1 (New DNN name)	The requested DNN is different from default DNN.	

Table 10.1.1.1.3.3-5: PDU SESSION ESTABLISHMENT REJECT (step 8, Table 10.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.2-3			
Information Element	Value/remark	Comment	Condition
PDU session ID	PSI-1		
PTI	PTI-1		
5GSM cause	'00011 101'	User authentication or authorization failed	

Table 10.1.1.1.3.3-6: PDU SESSION ESTABLISHMENT ACCEPT (step 17, Table 10.1.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.2-2			
Information Element	Value/remark	Comment	Condition
PDU session ID	PSI-1		
PTI	PTI-1		
Authorized QoS rules			
QoS rule			
QoS rule identifier	'0000 0001'B		
Rule operation code	'001'B	Create new QoS rule	
DQR bit	'1'B	The QoS rule is the default QoS rule.	
Number of packet filters	'0001'B	1 packet filter	
Packet filter list	See table 4.8.2.1-1	Packet filter list #1	
Packet filter direction	'11'B	bidirectional	
Packet filter identifier	'0000'B	Id 0	
Component type 1 ID	'0000 0001'B	Match-all type	
QoS rule precedence	'0000 0000'B	0	
QoS flow identifier (QFI)	'00 0011'B	QFI 3	
EAP message			
QoS flow description			
QFI	'00 0011'B	QFI 3	
Operation code	'001'B	Create new QoS flow description	
E bit	'1'B	Parameters list is included	
Number of parameters	'00 0001'B	1 parameters	
5QI	'0000 1001'B	5QI 9	
DNN	DNN-1		

10.1.1.2        PDU session authentication and authorization / after the UE-requested PDU session procedure

10.1.1.2.1        Test Purpose (TP)

(1)

with { the UE is in 5GMM-REGISTERED state with an established PDU session }  
  
ensure that {  
  
  when { UE receives a PDU SESSION AUTHENTICATION COMMAND message }  
  
    then { UE transmits a PDU SESSION AUTHENTICATION COMPLETE message }  
  
  }

(2)

with { PDU session authentication and authorization procedure is performed after the UE-requested PDU session establishment procedure }  
  
ensure that {  
  
  when { UE receives EAP-failure message in the PDU SESSION RELEASE COMMAND message }  
  
    then { the 5GSM state of the UE is PDU SESSION INACTIVE state }  
  
  }

}

(3)

**with** { PDU session authentication and authorization procedure is performed after the UE-requested PDU session establishment procedure }

**ensure that** {

**when** { UE receives EAP-success message in the PDU SESSION AUTHENTICATION RESULT message }

**then** { the 5GSM state of the UE is PDU SESSION ACTIVE state }

}

**10.1.1.2.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 6.3.1.1, clause 6.3.1.2.1, 6.3.1.2.2 and 6.3.1.3.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501 clause 6.3.1.1]

The purpose of the PDU session authentication and authorization procedure is to enable the DN:

- a) to authenticate the upper layers of the UE, when establishing the PDU session;
- b) to authorize the upper layers of the UE, when establishing the PDU session;
- c) both of the above; or
- d) to re-authenticate the upper layers of the UE after establishment of the PDU session.

The PDU session authentication and authorization procedure can be performed only during or after the UE-requested PDU session procedure establishing a non-emergency PDU session. The PDU session authentication and authorization procedure shall not be performed during or after the UE-requested PDU session establishment procedure establishing an emergency PDU session.

The network authenticates the UE using the Extensible Authentication Protocol (EAP) as specified in IETF RFC 3748 [32].

EAP has defined four types of EAP messages:

- a) an EAP-request message;
- b) an EAP-response message;
- c) an EAP-success message; and
- d) an EAP-failure message.

The EAP-request message is transported from the network to the UE using the PDU SESSION AUTHENTICATION COMMAND message of the PDU EAP message reliable transport procedure.

The EAP-response message to the EAP-request message is transported from the UE to the network using the PDU SESSION AUTHENTICATION COMPLETE message of the PDU EAP message reliable transport procedure.

If the PDU session authentication and authorization procedure is performed during the UE-requested PDU session establishment procedure:

- a) and the DN authentication of the UE completes successfully, the EAP-success message is transported from the network to the UE as part of the UE-requested PDU session establishment procedure in the PDU SESSION ESTABLISHMENT ACCEPT message.
- b) and the DN authentication of the UE completes unsuccessfully, the EAP-failure message is transported from the network to the UE as part of the UE-requested PDU session establishment procedure in the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU session authentication and authorization procedure is performed after the UE-requested PDU session establishment procedure:

- a) and the DN authentication of the UE completes successfully, the EAP-success message is transported from the network to the UE using the PDU SESSION AUTHENTICATION RESULT message of the PDU EAP result message transport procedure.
- b) and the DN authentication of the UE completes unsuccessfully, the EAP-failure message is transported from the network to the UE using the PDU SESSION RELEASE COMMAND message of the network-requested PDU session release procedure.

There can be several rounds of exchange of an EAP-request message and a related EAP-response message for the DN to complete the authentication and authorization of the request for a PDU session (see example in figure 6.3.1.1).

The SMF shall set the authenticator retransmission timer specified in IETF RFC 3748 [34] subclause 4.3 to infinite value.

NOTE: The PDU session authentication and authorization procedure provides a reliable transport of EAP messages and therefore retransmissions at the EAP layer of the SMF do not occur.

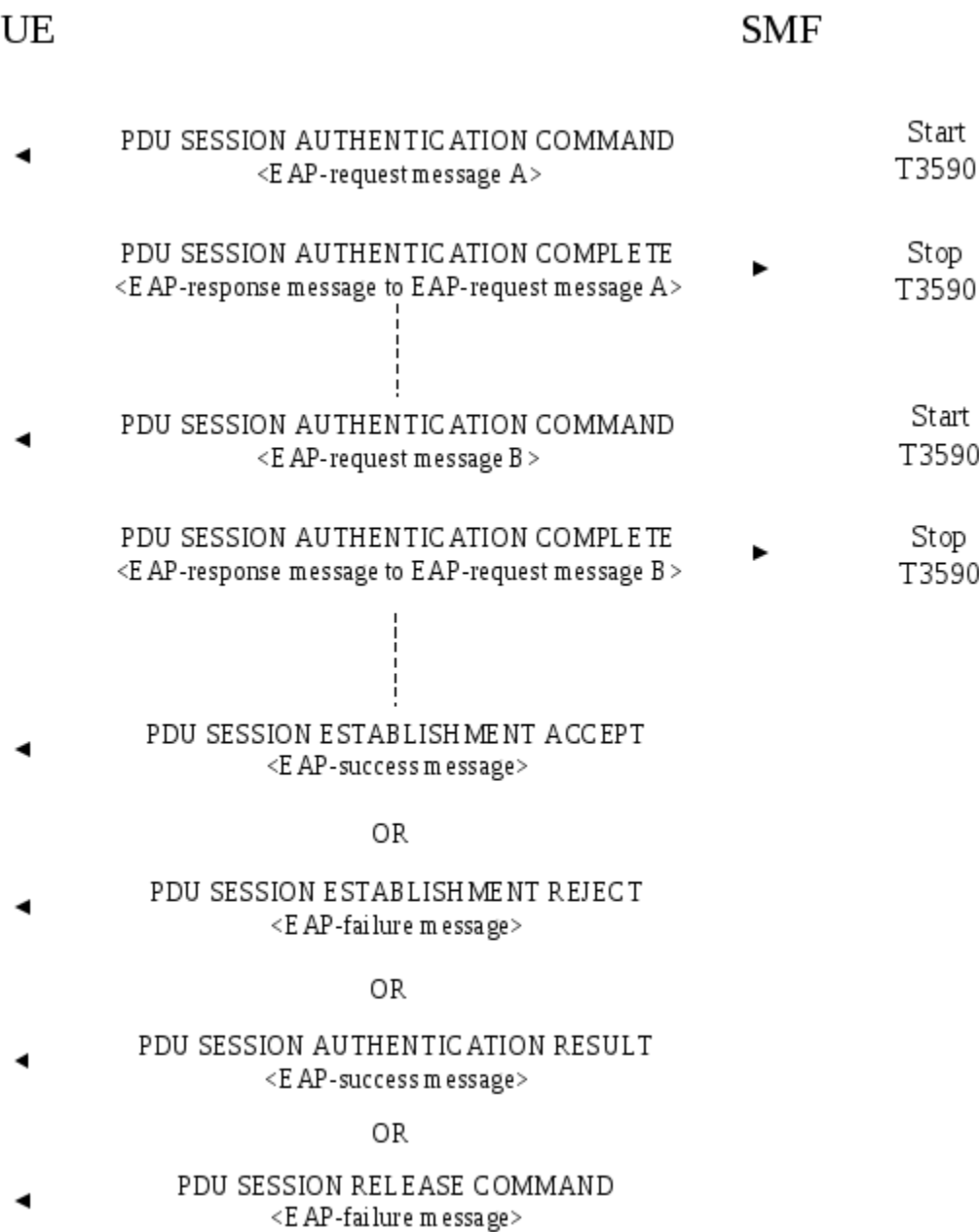


Figure 6.3.1.1: PDU session authentication and authorization procedure

[TS 24.501 clause 6.3.1.2.1]

In order to initiate the PDU EAP message reliable transport procedure, the SMF shall create a PDU SESSION AUTHENTICATION COMMAND message.

The SMF shall set the PTI IE of the PDU SESSION AUTHENTICATION COMMAND message to "No procedure transaction identity assigned".

The SMF shall set the EAP message IE of the PDU SESSION AUTHENTICATION COMMAND message to the EAP-request message provided by the DN or generated locally.

The SMF shall send the PDU SESSION AUTHENTICATION COMMAND message, and the SMF shall start timer T3590 (see example in figure 6.3.1.1).

Upon receipt of a PDU SESSION AUTHENTICATION COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE passes to the upper layers the EAP message received in the EAP message IE of the PDU SESSION AUTHENTICATION COMMAND message. Apart from this action, the authentication and authorization procedure initiated by the DN is transparent to the 5GSM layer of the UE.

[TS 24.501 clause 6.3.1.2.2]

When the upper layers provide an EAP-response message responding to the received EAP-request message, the UE shall create a PDU SESSION AUTHENTICATION COMPLETE message.

The UE shall set the EAP message IE of the PDU SESSION AUTHENTICATION COMPLETE message to the EAP-response message.

The UE shall transport the PDU SESSION AUTHENTICATION COMPLETE message and the PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5. Apart from this action, the authentication and authorization procedure initiated by the DN is transparent to the 5GSM layer of the UE.

Upon receipt of a PDU SESSION AUTHENTICATION COMPLETE message, the SMF shall stop timer T3590 and provides the EAP message received in the EAP message IE of the PDU SESSION AUTHENTICATION COMPLETE message to the DN or handles it locally.

[TS 24.501 clause 6.3.1.3.1]

In order to initiate the PDU EAP result message transport procedure, the SMF shall create a PDU SESSION AUTHENTICATION RESULT message.

The SMF shall set the PTI IE of the PDU SESSION AUTHENTICATION RESULT message to "No procedure transaction identity assigned".

The SMF shall set the EAP message IE of the PDU SESSION AUTHENTICATION RESULT message to the EAP-success message provided by the DN.

The SMF shall send the PDU SESSION AUTHENTICATION RESULT message.

Upon receipt of a PDU SESSION AUTHENTICATION RESULT message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE passes to the upper layers the EAP message received in the EAP message IE of the PDU SESSION AUTHENTICATION RESULT message. Apart from this action, the authentication and authorization procedure initiated by the DN is transparent to the 5GSM layer of the UE.

10.1.1.2.3	Test description
10.1.1.2.3.1	Pre-test conditions

System Simulator:

NGC Cell A

UE:

None.

Preamble:

The UE is in state 3N-A, on NGC Cell A with at least one PDU Session X (1<=X<=15) active according to TS 38.508-1 [4].

10.1.1.2.3.2 Test procedure sequence

Table 10.1.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
0A	Cause the UE to request establishment of PDU session Y to the DN.(Note 1)	-		-	-
0B	The PDU session establishment procedure as specified in TS 38.508-1 [4] subclause 4.5A.2 take place.	-		-	-
1	The SS transmits PDU SESSION AUTHENTICATION COMMAND including an EAP-Request message.	<--	PDU SESSION AUTHENTICATION COMMAND	-	-
2	Check: Does the UE transmit a PDU SESSION AUTHENTICATION COMPLETE containing EAP-Response message?	-->	PDU SESSION AUTHENTICATION COMPLETE	1	P
3	The SS transmits PDU SESSION AUTHENTICATION RESULT message containing an EAP-Success message.	<--	PDU SESSION AUTHENTICATION RESULT	-	-
4	The SS transmits PDU SESSION AUTHENTICATION COMMAND including an EAP-Request message.	<--	PDU SESSION AUTHENTICATION COMMAND	-	-
5	Check: Does the UE transmit a PDU SESSION AUTHENTICATION COMPLETE containing EAP-Response message?	-->	PDU SESSION AUTHENTICATION COMPLETE	3	P
6 - 17	Void	-	-	-	-
18	Check: Does the UE perform PDU session release procedure defined in clause 4.9.21 of TS 38.508-1 [4] with PDU SESSION RELEASE COMMAND including 5GSM cause #29 "user authentication or authorization failed"?	-	-	2-	P
19	Void	-	-	-	-
Note 1: The request of connectivity to an additional PDU session may be performed by MMI or AT command.					

10.1.1.2.3.3 Specific message contents

Table 10.1.1.2.3.3-1: Void

Table 10.1.1.2.3.3-2: Void

Table 10.1.1.2.3.3-2A: PDU SESSION AUTHENTICATION RESULT (step 3, Table 10.1.1.2.3.2-1)

Derivation Path: TS 38.508-1 table 4.7.2-6			
Information Element	Value/remark	Comment	Condition
EAP message	EAP-success	See TS 24.501 [25] subclause 9.11.2.2	



Table 10.1.1.2.3.3-3: Void

Table 10.1.1.2.3.3-3A: Void

Table 10.1.1.2.3.3-4: Void

Table 10.1.1.2.3.3-5: PDU SESSION RELEASE COMMAND (step 18, Table 10.1.1.2.3.2-1; step 1, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 13 in Table 10.1.1.2.3.2-1		
5GSM cause	'0001 1101'B	user authentication or authorization failed	
Back-off timer value	'1010 0000'B	0 minutes	
EAP Message	EAP-Failure	See TS 24.501 [25] subclause 9.11.2.2	

10.1.2 Network-requested PDU session modification

10.1.2.1 Network-requested PDU session modification / Accepted

10.1.2.1.1 Test Purpose (TP)

(1)

with { the UE in 5GMM-REGISTERED state with an established PDU session }  
  
ensure that {  
  
    when { the UE receives a PDU SESSION MODIFICATION COMMAND message }  
  
        then { UE sends a PDU SESSION MODIFICATION COMPLETE message and modifies the PDU session accordingly }  
  
}

(2)

with { the UE in 5GMM-REGISTERED state with an established PDU session has been modified }  
  
ensure that {  
  
    when { the UE has IP packets for transmission where each IP packet matches the modified packet filters configured in the UL TFTs for the PDU session }  
  
        then { the UE evaluates the packet filters in the correct evaluation order and transmits IP packets in uplink on the dedicated PDU session associated with the matched packet filter }  
  
}

}

#### 10.1.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 6.3.2.3 and TS 24.008, clause 10.5.6.12. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.3.2.3]

Upon receipt of the PDU SESSION MODIFICATION COMMAND message, if the UE provided a DNN during the PDU session establishment, the UE shall stop timer T3396, if it is running for the DNN provided by the UE. If the UE did not provide a DNN during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop the timer T3396 associated with no DNN if it is running. If the PDU SESSION MODIFICATION COMMAND message was received for an emergency PDU session, the UE shall not stop the timer T3396 associated with no DNN if it is running.

Upon receipt of the PDU SESSION MODIFICATION COMMAND message, if the UE provided an S-NSSAI and a DNN during the PDU session establishment, the UE shall stop timer T3584, if it is running for the same [S-NSSAI, DNN] combination provided by the UE. If the UE did not provide an S-NSSAI during the PDU session establishment, the UE shall stop timer T3584, if it is running for the same [no S-NSSAI, DNN] combination provided by the UE. If the UE provided neither a DNN nor an S-NSSAI during the PDU session establishment, the UE shall stop timer T3584, if it is running for the same [no S-NSSAI, no DNN] combination provided by the UE.

Upon receipt of the PDU SESSION MODIFICATION COMMAND message, if the UE provided an S-NSSAI during the PDU session establishment, the UE shall stop timer T3585, if it is running for the S-NSSAI provided by the UE. If the UE did not provide an S-NSSAI during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop the timer T3585 associated with no S-NSSAI if it is running. If the PDU SESSION MODIFICATION COMMAND message was received for an emergency PDU session, the UE shall not stop the timer T3585 associated with no S-NSSAI if it is running.

NOTE 1: Upon receipt of the PDU SESSION MODIFICATION COMMAND message for a PDU session, if the UE provided a DNN (or no DNN) and an S-NSSAI (or no S-NSSAI) when the PDU session is established, timer T3396 associated with the DNN (or no DNN, if no DNN was provided by the UE) is running, and timer T3584 associated with the DNN (or no DNN, if no DNN was provided by the UE) and the S-NSSAI (or no S-NSSAI, if no S-NSSAI was provided by the UE) is running, then the UE stops both the timer T3396 and the timer T3584.

NOTE 2: Upon receipt of the PDU SESSION MODIFICATION COMMAND message for a PDU session, if the UE provided a DNN (or no DNN) and an S-NSSAI (or no S-NSSAI) when the PDU session is established, timer T3585 associated with the S-NSSAI (or no S-NSSAI, if no S-NSSAI was provided by the UE) is running, and timer T3584 associated with the DNN (or no DNN, if no DNN was provided by the UE) and the S-NSSAI (or no S-NSSAI, if no S-NSSAI was provided by the UE) is running, then the UE stops both the timer T3585 and the timer T3584.

If the PDU SESSION MODIFICATION COMMAND message includes the Authorized QoS rules IE, the UE shall process the QoS rules sequentially starting with the first QoS rule.

The UE shall replace the stored authorized QoS rules, authorized QoS flow descriptions and session-AMBR of the PDU session with the received value(s), if any, in the PDU SESSION MODIFICATION COMMAND message.

If the PDU SESSION MODIFICATION COMMAND message includes a Mapped EPS bearer contexts IE, the UE shall check each mapped EPS bearer context for different types of errors as follows:

NOTE 3: An error detected in a mapped EPS bearer context does not cause the UE to discard the Authorized QoS rules IE and Authorized QoS flow descriptions IE included in the PDU SESSION MODIFICATION COMMAND message, if any.

a) Semantic error in the mapped EPS bearer operation:

- 1) operation code = "Create new EPS bearer" and there is already an existing mapped EPS bearer context with the same EPS bearer identity associated with any PDU session.
- 2) operation code = "Delete existing EPS bearer" and there is no existing mapped EPS bearer context with the same EPS bearer identity associated with the PDU session that is being modified.
- 3) operation code = "Modify existing EPS bearer" and there is no existing mapped EPS bearer context with the same EPS bearer identity associated with the PDU session that is being modified.

In case 1, if the existing mapped EPS bearer context is associated with the PDU session that is being modified, the UE shall not diagnose an error, further process the create request and, if it was process successfully, delete the old EPS bearer context.

In case 2, the UE shall not diagnose an error, further process the delete request and, if it was processed successfully, consider the mapped EPS bearer context as successfully deleted.

Otherwise, after sending the PDU SESSSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #85 "Invalid mapped EPS bearer identity".

b) if the mapped EPS bearer context includes a traffic flow template, the UE shall check the traffic flow template for different types of TFT IE errors as follows:

2) Semantic errors in TFT operations:

- i) TFT operation = "Create a new TFT" when there is already an existing TFT for the EPS bearer context.
- ii) When the TFT operation is an operation other than "Create a new TFT" and there is no TFT for the EPS bearer context.
- iii) TFT operation = "Delete packet filters from existing TFT" when it would render the TFT empty.
- iv) TFT operation = "Delete existing TFT" for a dedicated EPS bearer context.

In case iv, after sending the PDU SESSSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #41 "semantic error in the TFT operation".

In the other cases the UE shall not diagnose an error and perform the following actions to resolve the inconsistency:

In case i, the UE shall further process the new activation request and, if it was processed successfully, delete the old TFT.

In case ii, the UE shall:

- process the new request and if the TFT operation is "Delete existing TFT" or "Delete packet filters from existing TFT", and if no error according to items b, c, and d was detected, consider the TFT as successfully deleted;
- process the new request as an activation request, if the TFT operation is "Add packet filters in existing TFT" or "Replace packet filters in existing TFT".

In case iii, if the packet filters belong to a dedicated EPS bearer context, the UE shall process the new deletion request and, if no error according to items b, c, and d was detected, after sending the PDU SESSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #41 "semantic error in the TFT operation".

In case iii, if the packet filters belong to the default EPS bearer context, the UE shall process the new deletion request and if no error according to items b, c, and d was detected then delete the existing TFT, this corresponds to using match-all packet filter for the default EPS bearer context.

2) Syntactical errors in TFT operations:

- i) When the TFT operation = "Create a new TFT", "Add packet filters in existing TFT", "Replace packet filters in existing TFT" or "Delete packet filters from existing TFT" and the packet filter list in the TFT IE is empty.
- ii) TFT operation = "Delete existing TFT" or "No TFT operation" with a non-empty packet filter list in the TFT IE.
- iii) TFT operation = "Replace packet filters in existing TFT" when the packet filter to be replaced does not exist in the original TFT.
- iv) TFT operation = "Delete packet filters from existing TFT" when the packet filter to be deleted does not exist in the original TFT.
- v) TFT operation = "Delete packet filters from existing TFT" with a packet filter list also including packet filters in addition to the packet filter identifiers.
- vi) When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

In case iii, the UE shall not diagnose an error, further process the replace request and, if no error according to items c and d was detected, include the packet filters received to the existing TFT.

In case iv, the UE shall not diagnose an error, further process the deletion request and, if no error according to items c and d was detected, consider the respective packet filter as successfully deleted.

Otherwise, after sending the PDU SESSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #42 "syntactical error in the TFT operation".

3) Semantic errors in packet filters:

- i) When a packet filter consists of conflicting packet filter components which would render the packet filter ineffective, i.e. no IP packet will ever fit this packet filter. How the UE determines a semantic error in a packet filter is outside the scope of the present document.
- ii) When the resulting TFT, which is assigned to a dedicated EPS bearer context, does not contain any packet filter applicable for the uplink direction among the packet filters created on request from the network.

After sending the PDU SESSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #44 "semantic errors in packet filter(s)".

4) Syntactical errors in packet filters:

- i) When the TFT operation = "Create a new TFT", "Add packet filters to existing TFT", and two or more packet filters in the resultant TFT would have identical packet filter identifiers.
- ii) When the TFT operation = "Create a new TFT", "Add packet filters to existing TFT" or "Replace packet filters in existing TFT", and two or more packet filters among all TFTs associated with this PDN connection would have identical packet filter precedence values.
- iii) When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

In case i, if two or more packet filters with identical packet filter identifiers are contained in the new request, after sending the PDU SESSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #45 "syntactical error in packet filter(s)". Otherwise, the UE shall not diagnose an error, further process the new request and, if it was processed successfully, delete the old packet filters which have the identical packet filter identifiers.

In case ii, if the old packet filters do not belong to the default EPS bearer context, the UE shall not diagnose an error, shall further process the new request and, if it was processed successfully, shall delete the old packet filters which have identical filter precedence values.

In case ii, if one or more old packet filters belong to the default EPS bearer context, after sending the PDU SESSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #45 "syntactical errors in packet filter(s)".

Otherwise, after sending the PDU SESSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall initiate a PDU session modification procedure by sending a PDU SESSION MODIFICATION REQUEST message to delete the mapped EPS bearer context with 5GSM cause #45 "syntactical error in packet filter(s)".

And if a new EPS bearer identity parameter in authorized QoS flow descriptions IE is received for a QoS flow which can be transferred to EPS, the UE shall update the association between the QoS flow and the mapped EPS bearer context, based on the new EPS bearer identity and the mapped EPS bearer contexts. If the "Delete existing EPS bearer" operation code in the Mapped EPS bearer contexts IE was received, the UE shall discard the association between the QoS flow and the corresponding mapped EPS bearer context.

Upon receipt of a PDU SESSION MODIFICATION COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, if the UE accepts the PDU SESSION MODIFICATION COMMAND message, the UE considers the PDU session as modified and the UE shall create a PDU SESSION MODIFICATION COMPLETE message.

If the PDU SESSION MODIFICATION COMMAND message contains the PTI value allocated in the UE-requested PDU session modification procedure, the UE shall stop the timer T3581. The UE should ensure that the PTI value assigned to this procedure is not released immediately.

NOTE 4: The way to achieve this is implementation dependent. For example, the UE can ensure that the PTI value assigned to this procedure is not released during the time equal to or greater than the default value of timer T3591.

While the PTI value is not released, the UE regards any received PDU SESSION MODIFICATION COMMAND message with the same PTI value as a network retransmission (see subclause 7.3.1).

If the selected SSC mode of the PDU session is "SSC mode 3" and the PDU SESSION MODIFICATION COMMAND message includes 5GSM cause #39 "reactivation requested", the UE can provide to the upper layers the PDU session

address lifetime if received in the PDU session address lifetime PCO parameter of the Extended protocol configuration options IE of the PDU SESSION MODIFICATION COMMAND message. After the completion of the network-requested PDU session modification procedure, the UE should re-initiate the UE-requested PDU session establishment procedure with a new PDU session ID as specified in subclause 6.4.1 for:

- a) the PDU session type associated with the present PDU session;
- b) the SSC mode associated with the present PDU session;
- c) the DNN associated with the present PDU session; and
- d) the S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI if provided in the UE-requested PDU session establishment procedure of the present PDU session.

The UE shall include the PDU session ID of the old PDU session which is about to get released in the old PDU session ID IE of the UL NAS TRANSPORT message that transports the PDU SESSION ESTABLISHMENT REQUEST message.

NOTE 5: The UE is expected to maintain the PDU session for which the PDU SESSION MODIFICATION COMMAND message including 5GSM cause #39 "reactivation requested" is received during the time indicated by the PDU session address lifetime value or until receiving an indication from upper layers (e.g. that the old PDU session is no more needed).

If the selected PDU session type of the PDU session is "Unstructured" or "Ethernet", the UE supports inter-system change from N1 mode to S1 mode, the UE does not support establishment of a PDN connection for the PDN type set to "non-IP" in S1 mode, and the parameters list field of one or more authorized QoS flow descriptions received in the authorized QoS flow descriptions IE of the PDU SESSION MODIFICATION COMMAND message contains an EPS bearer identity (EBI) then the UE shall locally remove the EPS bearer identity (EBI) from the parameters list field of such one or more authorized QoS flow descriptions.

If the Always-on PDU session indication IE is included in the PDU SESSION MODIFICATION COMMAND message and:

- a) the value of the IE is set to "Always-on PDU session required", the UE shall consider the established PDU session as an always-on PDU session; or
- b) the value of the IE is set to "Always-on PDU session not allowed", the UE shall not consider the established PDU session as an always-on PDU session.

If the UE does not receive the Always-on PDU session indication IE in the PDU SESSION MODIFICATION COMMAND message:

- a) if the network-requested PDU session modification procedure is triggered by a UE-requested PDU session modification procedure upon the first inter-system change from S1 mode to N1 mode for a PDN connection established when in S1 mode, the UE shall not consider the modified PDU session as an always-on PDU session; or
- b) otherwise:
  - 1) if the UE has received the Always-on PDU session indication IE with the value set to "Always-on PDU session required" for this PDU session, the UE shall consider the PDU session as an always-on PDU session; or
  - 2) otherwise the UE shall not consider the PDU session as an always-on PDU session.

The UE shall transport the PDU SESSION MODIFICATION COMPLETE message and the PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5.

After sending the PDU SESSION MODIFICATION COMPLETE message, if the "Create new EPS bearer" operation code in the mapped EPS bearer contexts IE was received in the PDU SESSION MODIFICATION COMMAND message and there is neither a corresponding authorized QoS flow descriptions IE in the PDU SESSION MODIFICATION COMMAND message nor an existing QoS flow description corresponding to the EPS bearer identity included in the mapped EPS bearer context, the UE shall send a PDU SESSION MODIFICATION REQUEST message including a mapped EPS bearer contexts IE to delete the mapped EPS bearer context.

Upon receipt of a PDU SESSION MODIFICATION COMPLETE message, the SMF shall stop timer T3591 and shall consider the PDU session as modified. If the selected SSC mode of the PDU session is "SSC mode 3" and the PDU SESSION MODIFICATION COMMAND message included 5GSM cause #39 "reactivation requested", the SMF shall start timer T3593. If the PDU Session Address Lifetime value is sent to the UE in the PDU SESSION MODIFICATION COMMAND message then timer T3593 shall be started with the same value, otherwise it shall use a default value.

[TS 24.008, clause 10.5.6.12]

The purpose of the *traffic flow template* information element is to specify the TFT parameters and operations for a PDP context. In addition, this information element may be used to transfer extra parameters to the network (e.g. the Authorization Token; see 3GPP TS 24.229 [95]). The TFT may contain packet filters for the downlink direction, the uplink direction or packet filters that are applicable to both directions. The packet filters determine the traffic mapping to PDP contexts. The downlink packet filters shall be used by the network and the uplink packet filters shall be used by the MS. A packet filter that is applicable to both directions shall be used by the network as a downlink packet filter and by the MS as an uplink packet filter.

The *traffic flow template* is a type 4 information element with a minimum length of 3 octets. The maximum length for the IE is 257 octets.

NOTE 1: The IE length restriction is due to the maximum length that can be encoded in a single length octet.

NOTE 2: A maximum size IPv4 packet filter can be 32 bytes. Therefore, 7 maximum size IPv4 type packet filters, plus the last packet filter which can contain max 30 octets can fit into one TFT IE, i.e. if needed not all packet filter components can be defined into one message. A maximum size IPv6 packet filter can be 60 bytes. Therefore, only 4 maximum size IPv6 packet filters can fit into one TFT IE. However, using "Add packet filters to existing TFT", it's possible to create a TFT data structure including 16 maximum size IPv4 or IPv6 filters.

The *traffic flow template* information element is coded as shown in figure 10.5.144/3GPP TS 24.008 and table 10.5.162/3GPP TS 24.008.

NOTE 3: The 3GPP TS 24.301 [120] reuses the traffic flow template information element for the purpose of the traffic flow aggregate description, where the use of individual TFT parameters, e.g. the packet filter identifier in the parameter list, can differ from this specification.

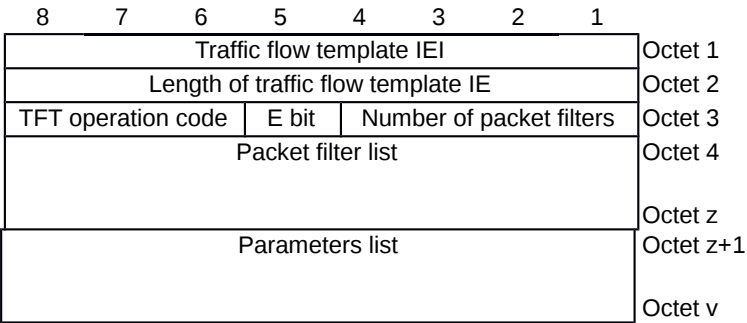
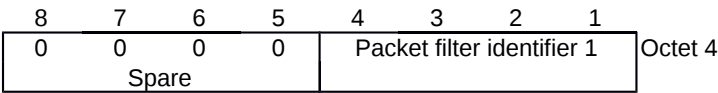


Figure 10.5.144/3GPP TS 24.008: Traffic flow template information element



0	0	0	0	Packet filter identifier 2	Octet 5
Spare					
...					
0	0	0	0	Packet filter identifier N	Octet N+3
Spare					

Figure 10.5.144a/3GPP TS 24.008: *Packet filter list* when the TFT operation is "delete packet filters from existing TFT" (z=N+3)

8	7	6	5	4	3	2	1							
0	0	Packet filter direction 1		Packet filter identifier 1				Octet 4						
Spare														
Packet filter evaluation precedence 1								Octet 5						
Length of Packet filter contents 1								Octet 6						
Packet filter contents 1								Octet 7						
								Octet m						
0	0	Packet filter direction 2		Packet filter identifier 2				Octet m+1						
Spare														
Packet filter evaluation precedence 2								Octet m+2						
Length of Packet filter contents 2								Octet m+3						
Packet filter contents 2								Octet m+4						
								Octet n						
...								Octet n+1						
								Octet y						
0	0	Packet filter direction N		Packet filter identifier N				Octet y+1						
Spare														
Packet filter evaluation precedence N								Octet y+2						
Length of Packet filter contents N								Octet y+3						
Packet filter contents N								Octet y+4						
								Octet z						

Figure 10.5.144b/3GPP TS 24.008: *Packet filter list* when the TFT operation is "create new TFT", or "add packet filters to existing TFT" or "replace packet filters in existing TFT"

8	7	6	5	4	3	2	1	
Parameter identifier 1								Octet z+1
Length of Parameter contents 1								Octet z+2
Parameter contents 1								Octet z+3
								Octet k
Parameter identifier 2								Octet k+1
Length of Parameter contents 2								Octet k+2
Parameter contents 2								Octet k+3
								Octet p
...								Octet p+1
								Octet q
Parameter identifier N								Octet q+1
Length of Parameter contents N								Octet q+2
Parameter contents N								Octet q+3
								Octet v

Figure 10.5.144c/3GPP TS 24.008: *Parameters list*



Table 10.5.162/3GPP TS 24.008: *Traffic flow template* information element

TFT operation code (octet 3)

Bits

8 7 6

0 0 0 Ignore this IE

0 0 1 Create new TFT

0 1 0 Delete existing TFT

0 1 1 Add packet filters to existing TFT

1 0 0 Replace packet filters in existing TFT

1 0 1 Delete packet filters from existing TFT

1 1 0 No TFT operation

1 1 1 Reserved

The TFT operation code "No TFT operation" shall be used if a *parameters list* is included but no *packet filter list* is included in the *traffic flow template* information element.

The TFT operation code "Ignore this IE" shall be used by the MS if the Traffic flow aggregate information element has presence requirement "M" in a message, but the information element does not serve any useful purpose in the specific procedure for which the message is sent (see 3GPP TS 24.301 [120], subclauses 6.5.3.2 and 6.5.4.2). If the TFT operation code indicates "Ignore this IE", the MS shall also set the E bit and the number of packet filters to zero.

If the TFT operation code is set to "Ignore this IE" and the E bit and the number of packet filters to zero, then the network shall ignore the contents of the traffic flow template information element.

E bit (bit 5 of octet 3)

The *E bit* indicates if a *parameters list* is included in the TFT IE and it is encoded as follows:

0 *parameters list* is not included

1 *parameters list* is included

Number of packet filters (octet 3)

The *number of packet filters* contains the binary coding for the number of packet filters in the *packet filter list*. The *number of packet filters* field is encoded in bits 4 through 1 of octet 3 where bit 4 is the most significant and bit 1 is the least significant bit. For the "delete existing TFT" operation and for the "no TFT operation", the *number of packet filters* shall be coded as 0. For all other operations, the number of packet filters shall be greater than 0 and less than or equal to 15.

Packet filter list (octets 4 to z)

The *packet filter list* contains a variable number of packet filters. For the "delete existing TFT" operation and the "no TFT operation", the *packet filter list* shall be empty.

For the "delete packet filters from existing TFT" operation, the *packet filter list* shall contain a variable number of packet filter identifiers. This number shall be derived from the coding of the *number of packet filters* field in octet 3.

For the "create new TFT", "add packet filters to existing TFT" and "replace packet filters in existing TFT" operations, the *packet filter list* shall contain a variable number of packet filters. This number shall be derived from the coding of the *number of packet filters* field in octet 3.

Each packet filter is of variable length and consists of

- a packet filter identifier and direction (1 octet);
- a packet filter evaluation precedence (1 octet);
- the length of the packet filter contents (1 octet); and
- the packet filter contents itself (v octets).

The *packet filter identifier* field is used to identify each packet filter in a TFT. The least significant 4 bits are used.

The *packet filter direction* is used to indicate, in bits 5 and 6, for what traffic direction the filter applies:

- 00 - pre Rel-7 TFT filter
  - 01 - downlink only
  - 10 - uplink only
  - 11 - bidirectional
- Bits 8 through 7 are spare bits.

The *packet filter evaluation precedence* field is used to specify the precedence for the packet filter among all packet filters in all TFTs associated with this PDP address. Higher the value of the *packet filter evaluation precedence* field, lower the precedence of that packet filter is. The first bit in transmission order is the most significant bit.

The *length of the packet filter contents* field contains the binary coded representation of the length of the *packet filter contents* field of a packet filter. The first bit in transmission order is the most significant bit.

The *packet filter contents* field is of variable size and contains a variable number (at least one) of *packet filter components*. Each *packet filter component* shall be encoded as a sequence of a one octet *packet filter component type identifier* and a fixed length *packet filter component value* field. The *packet filter component type identifier* shall be transmitted first.

In each packet filter, there shall not be more than one occurrence of each packet filter component type. Among the "IPv4 remote address type" and "IPv6 remote address type" packet filter components, only one shall be present in one packet filter. Among the "single local port type" and "local port range type" packet filter components, only one shall be present in one packet filter. Among the "single remote port type" and "remote port range type" packet filter components, only one shall be present in one packet filter.

The term *local* refers to the MS and the term *remote* refers to an external network entity.

Packet filter component type identifier

Bits

8	7	6	5	4	3	2	1	
0	0	0	1	0	0	0	0	IPv4 remote address type
0	0	0	1	0	0	0	1	IPv4 local address type
0	0	1	0	0	0	0	0	IPv6 remote address type
0	0	1	0	0	0	0	1	IPv6 remote address/prefix length type
0	0	1	0	0	0	1	1	IPv6 local address/prefix length type
0	0	1	1	0	0	0	0	Protocol identifier/Next header type
0	1	0	0	0	0	0	0	Single local port type
0	1	0	0	0	0	0	1	Local port range type
0	1	0	1	0	0	0	0	Single remote port type
0	1	0	1	0	0	0	1	Remote port range type
0	1	1	0	0	0	0	0	Security parameter index type
0	1	1	1	0	0	0	0	Type of service/Traffic class type
1	0	0	0	0	0	0	0	Flow label type
1	0	0	0	0	0	0	1	Destination MAC address type
1	0	0	0	0	0	1	0	Source MAC address type
1	0	0	0	0	0	1	1	802.1Q C-TAG VID type
1	0	0	0	0	1	0	0	802.1Q S-TAG VID type

1 0 0 0 0 1 0 1	802.1Q C-TAG PCP/DEI type
1 0 0 0 0 1 1 0	802.1Q S-TAG PCP/DEI type
1 0 0 0 0 1 1 1	Ethertype type
All other values are reserved.	
The description and valid combinations of packet filter component type identifiers in a packet filter are defined in 3GPP TS 23.060 [74] subclause 15.3.2.	
For "IPv4 remote address type", the <i>packet filter component value</i> field shall be encoded as a sequence of a four octet <i>IPv4 address</i> field and a four octet <i>IPv4 address mask</i> field. The <i>IPv4 address</i> field shall be transmitted first.	
For "IPv4 local address type", the <i>packet filter component value</i> field shall be encoded as defined for "IPv4 remote address type". Both the MS and network indication for support of the Local address in TFTs are required to use this packet filter component.	
For "IPv6 remote address type", the <i>packet filter component value</i> field shall be encoded as a sequence of a sixteen octet <i>IPv6 address</i> field and a sixteen octet <i>IPv6 address mask</i> field. The <i>IPv6 address</i> field shall be transmitted first.	
For "IPv6 remote address/prefix length type", the packet filter component value field shall be encoded as a sequence of a sixteen octet IPv6 address field and one octet prefix length field. The IPv6 address field shall be transmitted first. This parameter shall be used, instead of IPv6 remote address type, when both the MS and network indication for support of the Local address in TFT are present.	
For "IPv6 local address/prefix length type", the packet filter component value field shall be encoded as defined for "IPv6 remote address /prefix length". Both the MS and network indication for support of the Local address in TFTs are required to use this packet filter component.	
NOTE: Local IP address and mask can be used when IPv6 prefix delegation is used (see 3GPP TS 23.060 [74] subclause 9.2.1.2).	
For "Protocol identifier/Next header type", the <i>packet filter component value</i> field shall be encoded as one octet which specifies the IPv4 protocol identifier or IPv6 next header.	
For "Single local port type" and "Single remote port type", the <i>packet filter component value</i> field shall be encoded as two octet which specifies a port number.	
For "Local port range type" and "Remote port range type", the <i>packet filter component value</i> field shall be encoded as a sequence of a two octet <i>port range low limit</i> field and a two octet <i>port range high limit</i> field. The <i>port range low limit</i> field shall be transmitted first.	
For "Security parameter index", the <i>packet filter component value</i> field shall be encoded as four octet which specifies the IPSec security parameter index.	
For "Type of service/Traffic class type", the <i>packet filter component value</i> field shall be encoded as a sequence of a one octet <i>Type-of-Service/Traffic Class</i> field and a one octet <i>Type-of-Service/Traffic Class mask</i> field. The <i>Type-of-Service/Traffic Class</i> field shall be transmitted first.	
For "Flow label type", the <i>packet filter component value</i> field shall be encoded as three octet which specifies the IPv6 flow label. The bits 8 through 5 of the first octet shall be spare whereas the remaining 20 bits shall contain the IPv6 flow label. Parameters list (octets z+1 to v)	

For "destination MAC address type" and "source MAC address type", the *packet filter component value* field shall be encoded as 6 octets which specify a MAC address.

For "802.1Q C-TAG VID type", the *packet filter component value* field shall be encoded as two octets which specify the VID of the customer-VLAN tag (C-TAG). The bits 8 through 5 of the first octet shall be spare whereas the remaining 12 bits shall contain the VID.

For "802.1Q S-TAG VID type", the *packet filter component value* field shall be encoded as two octets which specify the VID of the service-VLAN tag (S-TAG). The bits 8 through 5 of the first octet shall be spare whereas the remaining 12 bits shall contain the VID.

For "802.1Q C-TAG PCP/DEI type", the *packet filter component value* field shall be encoded as one octet which specifies the 802.1Q C-TAG PCP and DEI. The bits 8 through 5 of the octet shall be spare, the bits 4 through 2 contain the PCP and bit 1 contains the DEI.

For "802.1Q S-TAG PCP/DEI type", the *packet filter component value* field shall be encoded as one octet which specifies the 802.1Q S-TAG PCP. The bits 8 through 5 of the octet shall be spare, the bits 4 through 2 contain the PCP and bit 1 contains the DEI.

For "ethertype type", the *packet filter component value* field shall be encoded as two octets which specify an ethertype.

The *parameters list* contains a variable number of parameters that may be transferred. If the *parameters list* is included, the *E bit* is set to 1; otherwise, the *E bit* is set to 0.

Each parameter included in the *parameters list* is of variable length and consists of:

- a parameter identifier (1 octet);
- the length of the parameter contents (1 octet); and
- the parameter contents itself (v octets).

The *parameter identifier* field is used to identify each parameter included in the *parameters list* and it contains the hexadecimal coding of the parameter identifier. Bit 8 of the *parameter identifier* field contains the most significant bit and bit 1 contains the least significant bit. In this version of the protocol, the following parameter identifiers are specified:

- 01H (Authorization Token);
- 02H (Flow Identifier); and
- 03H (Packet Filter Identifier).

If the *parameters list* contains a parameter identifier that is not supported by the receiving entity the corresponding parameter shall be discarded.

The *length of parameter contents* field contains the binary coded representation of the length of the *parameter contents* field. The first bit in transmission order is the most significant bit.

When the *parameter identifier* indicates Authorization Token, the *parameter contents* field contains an authorization token, as specified in 3GPP TS 29.207 [100]. The first octet is the most significant octet of the authorization token and the last octet is the least significant octet of the authorization token.

The *parameters list* shall be coded in a way that an Authorization Token (i.e. a parameter with identifier 01H) is always followed by one or more Flow Identifiers (i.e. one or more parameters with identifier 02H).

If the *parameters list* contains two or more consecutive Authorization Tokens without any Flow Identifiers in between, the receiver shall treat this as a semantical TFT error.

When the *parameter identifier* indicates Flow Identifier, the *parameter contents* field contains the binary representation of a flow identifier. The Flow Identifier consists of four octets. Octets 1 and 2 contains the Media Component number as specified in 3GPP TS 29.207 [100]. Bit 1 of octet 2 is the least significant bit, and bit 8 of octet 1 is the most significant bit. Octets 3 and 4 contains the IP flow number as specified in 3GPP TS 29.207 [100]. Bit 1 of octet 4 is the least significant bit, and bit 8 of octet 3 is the most significant bit.

When the *parameter identifier* indicates Packet Filter Identifier, the parameter contents field contains the binary representation of one or more packet filter identifiers. Each packet filter identifier is encoded in one octet, in the 4 least significant bits. This parameter is used by the MS and the network to identify one or more packet filters in a TFT when modifying the QoS of a PDP context without modifying the packet filter itself.

10.1.2.1.3            Test description

10.1.2.1.3.1            Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 3N-A on NGC Cell A with at least one PDU session for Internet active according to TS 38.508-1 [4], clause 4.4A.3 Table 4.4A.3-1 and using the message condition UE TEST LOOP MODE B active.

10.1.2.1.3.2            Test procedure sequence

Table 10.1.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The SS transmits a PDU session modification command message with PDU session ID IE is set to the same value as the first PDU session ID for Internet in the PDU SESSION ESTABLISHMENT REQUEST message. This message is included in a DLInformationTransfer message.	<--	PDU SESSION MODIFICATION COMMAND	-	-
2	Check: Does the UE transmit a PDU session modification complete?	-->	PDU SESSION MODIFICATION COMPLETE	1	P
3	The SS transmits one IP Packet matching with new packet filter (reference packet filter list #2).	-	-	-	-
4	Check: Does UE send the IP Packet on the data radio bearer associated with the PDU QoS rule?	-	-	2	P

10.1.2.1.3.3                      Specific message contents

Table 10.1.2.1.3.3-1: PDU SESSION MODIFICATION COMMAND (Step 1, Table 10.1.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-9			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The value the first PDU session ID for Internetindicated in PDU SESSION ESTABLISHMENT REQUEST message in the preamble		
Authorized QoS rules	Reference QoS rule #3 as defined in 38.508-1 [4] table 4.8.2.1-3.		

10.1.2.2                      Network-requested PDU session modification / Abnormal / PDU session in state PDU SESSION INACTIVE

10.1.2.2.1                      Test Purpose (TP)

```
(1)

with { the UE in PDU SESSION ACTIVE state and 5GMM-CONNECTED mode }

ensure that {

    when { the UE receives a PDU SESSION MODIFICATION COMMAND message include the PDU session ID which belong to any PDU session in PDU SESSION INACTIVE state in UE }

    then { UE sends a 5GSM STATUS message and set the 5GSM cause to #43: invalid PDU session identity }

}
```

10.1.2.2.2Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 6.3.2.6 and 7.3.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.3.2.6]

The following abnormal cases can be identified:

- a) PDU session inactive for the received PDU session ID.

If the PDU session ID in the PDU SESSION MODIFICATION COMMAND message belongs to any PDU session in state PDU SESSION INACTIVE in the UE, the UE shall set the 5GSM cause IE to #43 "Invalid PDU session identity" in the 5GSM STATUS message, and set the PDU session ID to the received PDU session ID in the UL NAS TRANSPORT message as specified in subclause 5.4.5.

[TS 24.501, clause 7.3.2]

The following UE procedures shall apply for handling an unknown, erroneous, or unforeseen PDU session identity received in the header of a 5GSM message:

- a) If the UE receives a 5GSM message which includes an unassigned or reserved PDU session identity value, the UE shall ignore the message.
- b) If the UE receives a 5GSM message which includes a PDU session identity belonging to any PDU session in state PDU SESSION INACTIVE in the UE, the UE shall respond with a 5GSM STATUS message including 5GSM cause #43 "invalid PDU session identity".

10.1.2.2.3Test description

10.1.2.2.3.1Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 3N-A on NGC Cell A with at least one PDU session for Internet active according to 38.508-1[4]

10.1.2.2.3.2Test procedure sequence

Table 10.1.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		



1	The generic test procedure in TS 38.508-1 clause 4.9.21 for PDU Session Release is performed message with PDU session ID IE is set to the same value as the first PDU session ID for Internet in PDU SESSION ESTABLISHMENT REQUEST message in preamble.	-	-	-	-
2	Void	-		-	-
3	The SS transmits a PDU session modification command message with PDU session ID IE is set to the same value in PDU SESSION RELEASE COMMAND message. This message is included in a DLInformationTransfer message.	<--	PDU SESSION MODIFICATION COMMAND	-	-
4	Check: Does the UE transmit a 5GSM STATUS with the 5GSM cause IE indicating #43 "invalid PDU session identity"?	-->	5GSM STATUS	1	P

10.1.2.2.3.3 Specific message contents

Table 10.1.2.2.3.3-1: PDU SESSION MODIFICATION COMMAND (Step 3, Table 10.1.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-9			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The same value in PDU SESSION RELEASE COMMAND message		

Table 10.1.2.2.3.3-2: 5GSM STATUS (Step 4, Table 10.1.2.2.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-16			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The same value as the value set in PDU SESSION modification command message		
5GSM cause	'00101011'B	Invalid PDU session identity	

Table 10.1.2.2.3.3-3: PDU SESSION RELEASE COMMAND (Step 1, Table 10.1.2.2.3.2-1; step 1, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-14			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The value of the first PDU session ID for Internet indicatedin PDU SESSION ESTABLISHMENT REQUEST message in preamble		

10.1.3 Network-requested PDU session release

10.1.3.1 Void

10.1.3.2 Network-requested PDU session release / Accepted / Insufficient resources / T3396, Accepted / Insufficient resources for specific slice and DNN / T3584, Abnormal / No PDU session context active for the received PDU session ID

10.1.3.2.1 Test Purpose (TP)

(1)

with { UE is in PDU SESSION ACTIVE state }

ensure that {

    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #26 "insufficient resources" and the Back-off timer value that indicates neither zero nor deactivated }

    then { UE does not send a PDU SESSION ESTABLISHMENT REQUEST until timer T3396 expires or timer T3396 is stopped }

    }

(2)

with { UE is in PDU SESSION ACTIVE state }

ensure that {

    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #26 "insufficient resources" and the Back-off timer value that indicates zero }

    then { UE sends a PDU SESSION ESTABLISHMENT REQUEST message }

    }

(3)

with { UE is in PDU SESSION ACTIVE state }

ensure that {

    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #26 "insufficient resources" and the Back-off timer value that indicates deactivated }

    then { UE does not send a PDU SESSION ESTABLISHMENT REQUEST message until the UE is switched off or the USIM is removed }

    }

(4)

with { UE is in PDU SESSION ACTIVE state }

```
ensure that {  
  
    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #67 "insufficient  
resources for specific slice and DNN" and the Back-off timer value that indicates neither zero nor  
deactivated }  
  
    then { UE does not send a PDU SESSION ESTABLISHMENT REQUEST message for the same [S-NSSAI, DNN]  
combination until timer T3584 expires }  
  
}
```

(5)

```
with { UE is in PDU SESSION ACTIVE state }  
  
ensure that {  
  
    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #67 "insufficient  
resources for specific slice and DNN" and the Back-off timer value that indicates zero }  
  
    then { UE sends a PDU SESSION ESTABLISHMENT REQUEST message for the same [S-NSSAI, DNN]  
combination }  
  
}
```

(6)

```
with { UE is in PDU SESSION ACTIVE state }  
  
ensure that {  
  
    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #67 "insufficient  
resources for specific slice and DNN" and the Back-off timer value that indicates deactivated }  
  
    then { UE does not send a PDU SESSION ESTABLISHMENT REQUEST message for the same [S-NSSAI, DNN]  
combination until the UE is switched off or the USIM is removed }  
  
}
```

(7)

```
with { UE is in PDU SESSION ACTIVE state }  
  
ensure that {  
  
    when { UE receives a PDU SESSION RELEASE COMMAND message, in which the PDU session ID belongs to  
any PDU session in state PDU SESSION INACTIVE in the UE }  
  
    then { UE sends 5GSM STATUS message including 5GSM cause #43 "Invalid PDU session identity" }  
  
}
```

10.1.3.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clause 6.3.3.2 and 6.3.3.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.3.3.2]

In order to initiate the network-requested PDU session release procedure, the SMF shall create a PDU SESSION RELEASE COMMAND message.

The SMF shall set the SM cause IE of the PDU SESSION RELEASE COMMAND message to indicate the reason for releasing the PDU session.

The SM cause IE typically indicates one of the following SM cause values:

#26 insufficient resources;

...

#67 insufficient resources for specific slice and DNN;

...

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #26 "insufficient resources" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #26 "insufficient resources" and the PDU SESSION RELEASE COMMAND message is sent to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #67 "insufficient resources for specific slice and DNN" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #67 "insufficient resources for specific slice and DNN" and the PDU SESSION RELEASE COMMAND message is sent to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

[TS 24.501, clause 6.3.3.3]

Upon receipt of a PDU SESSION RELEASE COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE considers the PDU session as released and the UE shall create a PDU SESSION RELEASE COMPLETE message.

...

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #26 "insufficient resources" and the Back-off timer value IE, the UE shall take different actions depending on the timer value received for timer T3396 in the Back-off timer value:

- a) If the timer value indicates neither zero nor deactivated and a DNN was provided during the PDU session establishment, the UE shall stop timer T3396 associated with the corresponding DNN, if it is running. If the timer value indicates neither zero nor deactivated and no DNN was provided during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop timer T3396 associated with no DNN if it is running. The UE shall then start timer T3396 with the value provided in the Back-off timer value IE and:
  - 1) shall not send a PDU SESSION ESTABLISHMENT REQUEST message or PDU SESSION MODIFICATION REQUEST message with exception of those identified in subclause 6.4.2.1, for the same DNN that was sent by the UE, until timer T3396 expires or timer T3396 is stopped; and
  - 2) shall not send a PDU SESSION ESTABLISHMENT REQUEST message without an DNN and with request type different from "initial emergency request" and different from "existing emergency PDU session", or a PDU SESSION MODIFICATION REQUEST message with exception of those identified in subclause 6.4.2.1, for a non-emergency PDU session established without an DNN provided by the UE, if no DNN was provided during the PDU session establishment and the request type was different from "initial

emergency request" and different from "existing emergency PDU session", until timer T3396 expires or timer T3396 is stopped.

The UE shall not stop timer T3396 upon a PLMN change or inter-system change;

- b) if the timer value indicates that this timer is deactivated and a DNN was provided during the PDU session establishment, the UE shall stop timer T3396 associated with the corresponding DNN, if it is running. If the timer value indicates that this timer is deactivated and no DNN was provided during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop timer T3396 associated with no DNN if it is running. The UE:
  - 1) shall not send a PDU SESSION ESTABLISHMENT REQUEST message or PDU SESSION MODIFICATION REQUEST message with exception of those identified in subclause 6.4.2.1, for the same DNN until the UE is switched off or the USIM is removed, or the UE receives a PDU SESSION MODIFICATION COMMAND message for the same DNN from the network or a PDU SESSION RELEASE COMMAND message including 5GSM cause #39 "reactivation requested" for the same DNN from the network; and
  - 2) shall not send a PDU SESSION ESTABLISHMENT REQUEST message without an DNN and with request type different from "initial emergency request" and different from "existing emergency PDU session", or a PDU SESSION MODIFICATION REQUEST message with exception of those identified in subclause 6.4.2.1, for a non-emergency PDU session established without an DNN provided by the UE, if no DNN was provided during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", until the UE is switched off or the USIM is removed, or the UE receives a PDU SESSION MODIFICATION COMMAND message for a non-emergency PDU session established without an DNN provided by the UE, or a PDU SESSION RELEASE COMMAND message including 5GSM cause IE set to 5GSM cause #39 "reactivation requested" for a non-emergency PDU session established without an DNN provided by the UE.

The timer T3396 remains deactivated upon a PLMN change or inter-system change; and

- c) if the timer value indicates zero, the UE:
  - 1) shall stop timer T3396 associated with the corresponding DNN, if running, and may send a PDU SESSION ESTABLISHMENT REQUEST message or PDU SESSION MODIFICATION REQUEST message for the same DNN; and
  - 2) if no DNN was provided during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop timer T3396 associated with no DNN, if running, and may send a PDU SESSION ESTABLISHMENT REQUEST message without a DNN, or a PDU SESSION MODIFICATION REQUEST message without an DNN provided by the UE.

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #26 "insufficient resources" and the Back-off timer value IE is not included, then the UE may send a PDU SESSION ESTABLISHMENT REQUEST message or PDU SESSION MODIFICATION REQUEST message for the same DNN or without a DNN.

When the timer T3396 is running or the timer is deactivated, the UE is allowed to initiate a PDU session establishment procedure for emergency services.

If the timer T3396 is running when the UE enters state 5GMM-DEREGISTERED, the UE remains switched on, and the USIM in the UE remains the same, then timer T3396 is kept running until it expires or it is stopped.

If the UE is switched off when the timer T3396 is running, and if the USIM in the UE remains the same when the UE is switched on, the UE shall behave as follows:

- let  $t_1$  be the time remaining for T3396 timeout at switch off and let  $t$  be the time elapsed between switch off and switch on. If  $t_1$  is greater than  $t$ , then the timer shall be restarted with the value  $t_1 - t$ . If  $t_1$  is equal to or less than

t, then the timer need not be restarted. If the UE is not capable of determining t, then the UE shall restart the timer with the value t1.

If the 5GSM cause value is #67 "insufficient resources for specific slice and DNN" and the Back-off timer value IE is included, the UE shall take different actions depending on the timer value received for timer T3584 in the Back-off timer value:

- a) If the timer value indicates neither zero nor deactivated, the UE shall stop timer T3584 associated with the same [S-NSSAI, DNN] combination as that the UE provided when the PDU session is established, if it is running. The UE shall then start timer T3584 with the value provided in the Back-off timer value IE.

The UE shall not send another PDU SESSION ESTABLISHMENT REQUEST message with request type different from "initial emergency request" and different from "existing emergency PDU session", or PDU SESSION MODIFICATION REQUEST message with exception of those identified in subclause 6.4.2.1, for the same [S-NSSAI, DNN] combination that was sent by the UE, until timer T3584 expires or timer T3584 is stopped;

The UE shall not stop timer T3584 upon a PLMN change or inter-system change;

- b) if the timer value indicates that this timer is deactivated, the UE shall stop timer T3584 associated with the same [S-NSSAI, DNN] combination as that the UE provided when the PDU session is established, if it is running.

The UE shall not send another PDU SESSION ESTABLISHMENT REQUEST message with request type different from "initial emergency request" and different from "existing emergency PDU session", or PDU SESSION MODIFICATION REQUEST message with exception of those identified in subclause 6.4.2.1, for the same [S-NSSAI, DNN] combination that was sent by the UE, until the UE is switched off or the USIM is removed, or the UE receives a PDU SESSION MODIFICATION REQUEST message for the same [S-NSSAI, DNN] combination from the network or a PDU SESSION RELEASE COMMAND message including 5GSM cause #39 "reactivation requested" for the same [S-NSSAI, DNN] combination from the network; and

The timer T3584 remains deactivated upon a PLMN change or inter-system change; and

- c) if the timer value indicates zero, the UE shall stop timer T3584 associated with the same [S-NSSAI, DNN] combination that was sent by the UE, if running, and may send another PDU SESSION ESTABLISHMENT REQUEST message or PDU SESSION MODIFICATION REQUEST message for the same [S-NSSAI, DNN] combination.

If the 5GSM cause value is #67 "insufficient resources for specific slice and DNN" and the Back-off timer value IE is not included, then the UE may send another PDU SESSION ESTABLISHMENT REQUEST message or PDU SESSION MODIFICATION REQUEST message for the same [S-NSSAI, DNN] combination.

When the timer T3584 is running or the timer is deactivated, the UE is allowed to initiate a PDU session establishment procedure for emergency services.

If the timer T3584 is running when the UE enters state 5GMM-DEREGISTERED, the UE remains switched on, and the USIM in the UE remains the same, then timer T3584 is kept running until it expires or it is stopped.

If the UE is switched off when the timer T3584 is running, and if the USIM in the UE remains the same when the UE is switched on, the UE shall behave as follows:

- let t1 be the time remaining for T3584 timeout at switch off and let t be the time elapsed between switch off and switch on. If t1 is greater than t, then the timer shall be restarted with the value t1 – t. If t1 is equal to or less than t, then the timer need not be restarted. If the UE is not capable of determining t, then the UE shall restart the timer with the value t1.

[TS 24.501, clause 6.3.3.6]

The following abnormal cases can be identified:

a) PDU session inactive for the received PDU session ID.

If the PDU session ID in the PDU SESSION RELEASE COMMAND message belongs to any PDU session in state PDU SESSION INACTIVE in the UE, the UE shall include the 5GSM cause #43 "Invalid PDU session identity" in the 5GSM STATUS message, and set the PDU session ID to the received PDU session ID in the UL NAS TRANSPORT message as specified in subclause 5.4.5.

[TS 24.501, clause B.1]

Cause #43 –Invalid PDU session identity

This 5GSM cause is used by the network or the UE to indicate that the PDU session identity value provided to it is not a valid value or the PDU session identified by the PDU session identity IE in the request or the command is not active.

[24.501, clause 7.3.2]

...

The following UE procedures shall apply for handling an unknown, erroneous, or unforeseen PDU session identity received in the header of a 5GSM message:

- a) If the UE receives a 5GSM message which includes an unassigned or reserved PDU session identity value, the UE shall ignore the message.
- b) If the UE receives a 5GSM message which includes a PDU session identity belonging to any PDU session in state PDU SESSION INACTIVE in the UE, the UE shall respond with a 5GSM STATUS message including 5GSM cause #43 "invalid PDU session identity".

10.1.3.2.3            Test description

10.1.3.2.3.1        Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

None.

Preamble:

- The UE is in state 3N-A on NGC Cell A according to TS 38.508-1 [4].

10.1.3.2.3.2        Test procedure sequence

Table 10.1.3.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		

1	Cause the UE to request establishment of PDU session without DNN.(Note 1)	-	-	-	-
2	The PDU session establishment procedure as specified in TS 38.508-1 [4] subclause 4.5A.2 take place.	-	-	-	-
3	The generic test procedure in TS 38.508-1 Table 4.9.21.2.2-1 of Procedure for PDU Session Release is performed.	-	-	-	-
4	Void	-	-	-	-
5	Cause the UE to request establishment of PDU session without DNN within 2 minutes of Step 3 (Note 1)	-	-	-	-
6	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message before timer T3396 has expired?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	F
7	Cause the UE to request establishment of PDU session without DNN after 2 minutes since Step 3.(Note 1)	-	-	-	-
8	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
9	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
10	The generic test procedure in TS 38.508-1 Table 4.9.21.2.2-1 of Procedure for PDU Session Release is performed	-	-	-	-
11	Void	-	-	-	-
12	Cause the UE to request establishment of PDU session without DNN.(Note 1)	-	-	-	-
13	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	2	P
14	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
15	The generic test procedure in TS 38.508-1 Table 4.9.21.2.2-1 of Procedure for PDU Session Release is performed	-	-	-	-
16	Void	-	-	-	-
17	Cause the UE to request establishment of PDU session without DNN.(Note 1)	-	-	-	-
18	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message in 5 seconds?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	3	F
19	Switch off UE in RRC CONNECTED as described in TS38.508-1 [4] subclause 4.9.6.3	-			
20	Switch on UE.	-			
21	The general procedure is completed by executing of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-2 , ' <i>connected without release</i> '.	-			
22	Cause the UE to request establishment of PDU session without DNN.(Note 1)	-	-	-	-
23	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	3	P
24	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
25	Cause the UE to request establishment of	-	-	-	-



	PDU session with [S-NSSAI, DNN] combination.(Note 1)				
--	--	--	--	--	--

26	The PDU session establishment procedure as specified in TS 38.508-1 [4] subclause 4.5A.2 take place.	-	-	-	-
27	The generic test procedure in TS 38.508-1 Table 4.9.21.2.2-1 of Procedure for PDU Session Release is performed	-	-	-	-
28	Void	-	-	-	-
29	Cause the UE to request establishment of PDU session with the same [S-NSSAI, DNN] combination as the PDU session established at step 26 within 2 minutes of Step 27.(Note 1)	-	-	-	-
30	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST before timer T3584 has expired?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	4	F
31	Cause the UE to request establishment of PDU session with the same [S-NSSAI, DNN] combination as the PDU session established at step 26 after 2 minutes since Step 27.(Note 1)	-	-	-	-
32	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	4	P
33	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
34	The generic test procedure in TS 38.508-1 Table 4.9.21.2.2-1 of Procedure for PDU Session Release is performed	-	-	-	-
35	Void	-	-	-	-
36	Cause the UE to request establishment of PDU session with the same [S-NSSAI, DNN] combination as the PDU session established at step 26.(Note 1)	-	-	-	-
37	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	5	P
38	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
39	The generic test procedure in TS 38.508-1 Table 4.9.21.2.2-1 of Procedure for PDU Session Release is performed	-	-	-	-
40	Void	-	-	-	-
41	Cause the UE to request establishment of PDU session with the same [S-NSSAI, DNN] combination as the PDU session established at step 26.(Note 1)	-	-	-	-
42	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST in 5 seconds?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	6	F
43	The SS transmits a PDU SESSION RELEASE COMMAND including the PDU session ID UE requested in step 42.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION RELEASE COMMAND	-	-
44	Check: Does the UE transmit a 5GSM STATUS message with value #43?	-->	5GSM: UL NAS TRANSPORT 5GSM: 5GSM STATUS	7	P
45	Switch off UE in RRC CONNECTED as described in TS38.508-1 [4] subclause 4.9.6.3	-	-	-	-
46	Switch on UE.	-	-	-	-
47	The general procedure is completed by executing of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-2 , 'connected	-	-	-	-

	without release'.				
48	Cause the UE to request establishment of PDU session with the same [S-NSSAI, DNN] combination as the PDU session established at step 26.(Note 1)	-	-	-	-
49	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	6	P
50	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
Note 1: The request to establish a PDU session may be performed by MMI or AT Command.					

Table 10.1.3.2.3.2-2: Void

Table 10.1.3.2.3.2-3: Void

10.1.3.2.3.3            Specific message contents

Table 10.1.3.2.3.3-1: UL NAS TRANSPORT (step 2, 8, 13 and 23, Table 10.1.3.2.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0001'B	N1 SM information	
Payload container	PDU SESSION ESTABLISHMENT REQUEST		
DNN	Not present		

Table 10.1.3.2.3.3-2: PDU SESSION RELEASE COMMAND (step 3, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 2 in Table 10.1.3.2.3.2-1		
5GSM cause	'0001 1010'B	insufficient resources	
Back-off timer value	'0010 0010'B	2 minutes	

Table 10.1.3.2.3.3-3: Void

Table 10.1.3.2.3.3-4: PDU SESSION RELEASE COMMAND (step 10, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition

PDU session ID	The same ID as the ID of PDU session which UE request in step 8 in Table 10.1.3.2.3.2-1		
5GSM cause	'0001 1010'B	insufficient resources	
Back-off timer value	'1010 0000'B	0 minutes	

Table 10.1.3.2.3.3-5: PDU SESSION RELEASE COMMAND (step 15, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 13 in Table 10.1.3.2.3.2-1		
5GSM cause	'0001 1010'B	insufficient resources	
Back-off timer value	'1110 0000'B	deactivated	

Table 10.1.3.2.3.3-6: UL NAS TRANSPORT (step 26, Table 10.1.3.2.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0001'B	N1 SM information	
Payload container	PDU SESSION ESTABLISHMENT REQUEST		
S-NSSAI	present		
DNN	present		

Table 10.1.3.2.3.3-7: PDU SESSION RELEASE COMMAND (step 27, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 26 in Table 10.1.3.2.3.2-1		
5GSM cause	'0100 0011'B	insufficient resources for specific slice and DNN	
Back-off timer value	'0010 0010'B	2 minutes	

Table 10.1.3.2.3.3-8: UL NAS TRANSPORT (step 32, 37 and 49, Table 10.1.3.2.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	'0001'B	N1 SM information	
Payload container	PDU SESSION ESTABLISHMENT REQUEST		
S-NSSAI	The same S-NSSAI as the S-NSSAI of the PDU session which UE request at step 26		
DNN	The same DNN as the DNN of the PDU session which UE request at step 26		

Table 10.1.3.2.3.3-9: PDU SESSION RELEASE COMMAND (step 34, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 32 in Table 10.1.3.2.3.2-1		
5GSM cause	'0100 0011'B	insufficient resources for specific slice and DNN	
Back-off timer value	'1010 0000'B	0 minutes	

Table 10.1.3.2.3.3-10: PDU SESSION RELEASE COMMAND (step 39, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 37 in Table 10.1.3.2.3.2-1		
5GSM cause	'0100 0011'B	insufficient resources for specific slice and DNN	
Back-off timer value	'1110 0000'B	deactivated	

Table 10.1.3.2.3.3-11: PDU SESSION RELEASE COMMAND (step 43, Table 10.1.3.2.3.2-1; step 1, Table 4.9.21.2.2-1, TS 38.508-1[4])

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition

PDU session ID	The same ID as the ID of PDU session which UE request in step 37 in Table 10.1.3.2.3.2-1		
5GSM cause	'0010 0100'B	#36 regular deactivation	

Table 10.1.3.2.3.3-11A: UL NAS TRANSPORT (step 44, Table 10.1.3.2.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
PDU session ID	The same ID as the ID of PDU session which UE request in step 37 in Table 10.1.3.2.3.2-1		
Payload container type	'0001'B	N1 SM information	
Payload container	5GSM STATUS		

Table 10.1.3.2.3.3-12: 5GSM STATUS (Table 10.1.3.2.3.3-11)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-16			
Information Element	Value/remark	Comment	Condition
5GSM cause	'0010 1011'B	#43 Invalid PDU session identity	

## 10.1.4 UE-requested PDU session establishment

### 10.1.4.1 UE-requested PDU session establishment / Abnormal / T3580

#### 10.1.4.1.1 Test Purpose (TP)

(1)

**with** { the UE in 5GMM-REGISTERED state and at least one PDU session has been established. the SS sends PDU SESSION RELEASE COMMAND with #39 "reactivation requested", and the UE has sent a PDU SESSION ESTABLISHMENT REQUEST message }

**ensure that** {

**when** { On the 1st, 2nd, 3rd, 4th expiry of timer T3580 }

**then** { the UE retransmits PDU SESSION ESTABLISHMENT REQUEST message for the same [S-NSSAI, DNN] values provided in PDU SESSION RELEASE COMMAND }

    }

(2)

**with** { the UE in 5GMM-REGISTERED state and has sent a PDU SESSION ESTABLISHMENT REQUEST message }

**ensure that** {

**when** { on the maximum 5th expiry of timer T3580 }

```
    then { the UE aborts the procedure }  
  
}
```

10.1.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 6.4.1.6.  
Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.4.1.6]

The following abnormal cases can be identified:

- a) Expiry of timer T3580
- The UE shall, on the first expiry of the timer T3580, retransmit the PDU SESSION ESTABLISHMENT REQUEST message and the PDU session information which was transported together with the initial transmission of the PDU SESSION ESTABLISHMENT REQUEST message and shall reset and start timer T3580, if still needed. This retransmission can be repeated up to four times, i.e. on the fifth expiry of timer T3580, the UE shall abort the procedure, release the allocated PTI and enter the state PROCEDURE TRANSACTION INACTIVE.

10.1.4.1.3 Test description

10.1.4.1.3.1 Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 3N-A on NGC Cell A with at least one PDU session X (1 <= X <= 15) active according to 38.508-1[4].

10.1.4.1.3.2 Test procedure sequence

Table 10.1.4.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The generic test procedure in TS 38.508-1 clause 4.9.21 for PDU Session Release is performed with PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested" to release PDU session X.	-	-	-	-
2-15	Void.	-	-	-	-
16	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values as released (Note 2).	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	-	-
17	The SS waits 16 seconds (T3580).	-	-	-	-
18	Check: Does the UE re-transmit the PDU SESSION ESTABLISHMENT REQUEST message and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values as sent in step 16?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
19	The SS waits 16 seconds (2 <sup>nd</sup> expiry of T3580).	-	-	-	-
20	Check: Does the UE re-transmit the PDU SESSION ESTABLISHMENT REQUEST message and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values as sent in step 16?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
21	The SS waits 16 seconds (3 <sup>rd</sup> expiry of T3580).	-	-	-	-
22	Check: Does the UE re-transmit the PDU SESSION ESTABLISHMENT REQUEST message and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values as sent in step 16?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
23	The SS waits 16 seconds (4 <sup>th</sup> expiry of T3580).	-	-	-	-
24	Check: Does the UE re-transmit the PDU SESSION ESTABLISHMENT REQUEST message and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values as sent in step 16?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
25	The SS waits 16 seconds (5 <sup>th</sup> expiry of T3580).	-	-	-	-
26	Check: Does the UE re-transmit the PDU SESSION ESTABLISHMENT REQUEST message and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values as sent in step 16 in the next 20 seconds? (Note 1)	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	2	F
Note 1: The 20 seconds is chosen randomly as long as it is greater than T3580 = 16 seconds.					
Note 2 : At step 16 the SS waits for 1s for the UE to transmit the PDU Session Establishment REQ. Upon expiry of 1s, the PDU Session Establishment may be performed by MMI or AT command.					

10.1.4.1.3.3            Specific message contents

Table 10.1.4.1.3.3-1: PDU SESSION RELEASE COMMAND (Step 1, Table 10.1.4.1.3.2-1; step 1, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-14			
Information Element	Value/Remark	Comment	Condition



PDU session ID	X	ID of the active PDU session in preamble	
5GSM cause	'0010 0111'B	Reactivation requested	

Table 10.1.4.1.3.3-2: UL NAS TRANSPORT (Step 16, 18, 20, 22, 24 Table 10.1.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-1			
Information Element	Value/Remark	Comment	Condition
S-NSSAI	Same as the S-NSSAI of PDU session X in the Preamble		
DNN	Same as the DN of PDU session X in the Preamble		

## 10.1.5 UE-requested PDU session modification

### 10.1.5.1 UE-requested PDU session modification

#### 10.1.5.1.1 Test Purpose (TP)

(1)

```
with { UE in PDU SESSION ACTIVE state and in 5GMM-CONNECTED mode }  
  
ensure that {  
  
    when { UE is requested to modify of PDU session }  
  
        then { UE sends a PDU SESSION MODIFICATION REQUEST message }  
  
}
```

#### 10.1.5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clause 6.4.2.1 and 6.4.2.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.4.2.1]

The purpose of the UE-requested PDU session modification procedure is:

- a) to enable the UE to request modification of a PDU session;
- b) to indicate a change of 3GPP PS data off UE status for a PDU session;
- c) to revoke the previously indicated support for reflective QoS;
- d) to request specific QoS handling and segregation of service data flows;
- e) to indicate to the network the relevant 5GSM parameters and capabilities (e.g. the UE's 5GSM capabilities, whether the UE supports more than 16 packet filters, the maximum data rate per UE for user-plane integrity

protection supported by the UE for uplink and the maximum data rate per UE for user-plane integrity protection supported by the UE for downlink) for a PDN connection established when in S1 mode, after the first inter-system change from S1 mode to N1 mode, if the UE is operating in single-registration mode in the network supporting N26 interface; or

- f) to delete one or more mapped EPS bearer contexts.

NOTE: The UE does not request a PDU session modification for an LADN when the UE is located outside the LADN service area.

[TS 24.501, clause 6.4.2.2]

In order to initiate the UE-requested PDU session modification procedure, the UE shall create a PDU SESSION MODIFICATION REQUEST message.

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION MODIFICATION REQUEST message to the allocated PTI value.

The UE shall not perform the UE-requested PDU session modification procedure for an emergency PDU session.

The UE shall not perform the UE-requested PDU session modification procedure for a PDU session for LADN when the UE is located outside the LADN service area.

If the UE requests a specific QoS handling, the UE shall include the requested QoS rules IE indicating requested QoS rules and the requested QoS flow descriptions IE indicating requested QoS flow descriptions for the specific QoS handling. The QoS rules IE includes the packet filters which describe the service data flows requested by the UE. The specific QoS parameters requested by the UE is specified in the QoS flow descriptions IE. If the UE requests the network to bind specific service data flows to a dedicated QoS flow, the UE shall create a new QoS rule by setting the rule operation code to "Create new QoS rule" and shall set the segregation bit to "Segregation requested" for the corresponding QoS rule in the QoS rules IE. The UE shall set the QRI values to "no QoS rule identifier assigned" in the requested QoS rules IE, if the QoS rules are newly created; otherwise, the UE shall set the QRI values to those of the existing QoS rules for which the specific QoS handling applies. The UE shall set the QFI values to "no QoS flow identifier assigned" in the requested QoS flow descriptions IE, if the QoS flow descriptions are newly created; otherwise, the UE shall set the QFI values to the QFIs of the existing QoS flow descriptions for which the specific QoS handling applies.

...

If the UE is performing the PDU session modification procedure to request the deletion of a non-default QoS rule due to errors in QoS operations or packet filters, the UE shall include the 5GSM cause IE in the PDU SESSION MODIFICATION REQUEST message as described in subclause 6.4.1.3.

Even if the timer T3396, T3584, or T3585 is running or is deactivated, the UE shall indicate a change of 3GPP PS data off UE status associated to a PDU session, by including the extended protocol configuration options IE in the PDU SESSION MODIFICATION REQUEST message and setting the 3GPP PS data off UE status.

For a PDN connection established when in S1 mode, after the first inter-system change from S1 mode to N1 mode, if the UE is operating in single-registration mode in the network supporting N26 interface and the UE requests the PDU session to be an always-on PDU session in the 5GS, the UE shall include the Always-on PDU session requested IE and set the value of the IE to "Always-on PDU session requested" in the PDU SESSION MODIFICATION REQUEST message.

The UE shall transport the PDU SESSION MODIFICATION REQUEST message, the PDU session ID, and the request type set to "modification request", using the NAS transport procedure as specified in subclause 5.4.5, and the UE shall start timer T3581 (see example in figure 6.4.2.2.1).

10.1.5.1.3

Test description

10.1.5.1.3.1

Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

- None.

Preamble:

- The UE is in state 3N-A on NGC Cell A with PDU SESSION ACTIVE according to TS 38.508-1[4].

10.1.5.1.3.2

Test procedure sequence

Table 10.1.5.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
1	Cause the UE to pdu session modification with the previously established PDN session at preamble. (see Note)	-	-	-	-
2	Check: Does the UE transmit a PDU SESSION MODIFICATION REQUEST message?	-->	PDU SESSION MODIFICATION REQUEST	1	P
3	The SS transmits an PDU SESSION MODIFICATION COMMAND message.	<--	PDU SESSION MODIFICATION COMMAND	-	-
4	the UE transmit an PDU SESSION MODIFICATION COMPLETE message.	-->	PDU SESSION MODIFICATION COMPLETE	-	-
Note: The request of pdu session modification may be performed by MMI or AT command.					

10.1.5.1.3.3

Specific message contents

Table 10.1.5.1.3.3-1: PDU SESSION MODIFICATION COMMAND (step 3, Table 10.1.5.1.3.2-1)

Derivation path: TS 36.508, Table 4.7.2-9			
Information Element	Value/remark	Comment	Condition

PDU session ID	The value indicated in PDU SESSION MODIFICATION REQUEST		
PTI	The value indicated in PDU SESSION MODIFICATION REQUEST		
Authorized QoS rules	According to QoS rule #1 except for Rule operation code set to '100'B and QoS rule precedence set to '0000 0010'- see TS 38.508-1[4]		

10.1.6 UE-requested PDU session release

10.1.6.1 UE-requested PDU session release / Abnormal / Collision with network-requested PDU session modification procedure

10.1.6.1.1 Test Purpose (TP)

(1)

with { the UE is in PDU SESSION ACTIVE state and has sent a PDU SESSION RELEASE REQUEST message }

ensure that {

    when { UE receives a PDU SESSION MODIFICATION COMMAND message indicating a PDU session that UE wants to release }

        then { the UE ignores the PDU SESSION MODIFICATION COMMAND message and proceed with the PDU session release procedure }

    }

10.1.6.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clause 6.4.3.2, 6.4.3.3 and 6.4.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.4.3.2]

In order to initiate the UE-requested PDU session release procedure, the UE shall create a PDU SESSION RELEASE REQUEST message.

The UE may set the 5GSM cause IE of the PDU SESSION RELEASE REQUEST message to indicate the reason for releasing the PDU session.

The 5GSM cause IE typically indicates one of the following 5GSM cause values:

- #36 regular deactivation;
- #41 Semantic error in the TFT operation;
- #42 Syntactical error in the TFT operation;
- #44 Semantic errors in packet filter(s);

#45     Syntactical error in packet filter(s).

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION RELEASE REQUEST message to the allocated PTI value.

The UE shall transport the PDU SESSION RELEASE REQUEST message and the PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, and the UE shall start timer T3582 (see example in figure 6.4.3.2.1).

[TS 24.501, clause 6.4.3.3]

Upon receipt of a PDU SESSION RELEASE REQUEST message and a PDU session ID, if the SMF accepts the request to release the PDU session, and shall perform the network-requested PDU session release procedure as specified in subclause 6.3.3.

[TS 24.501, clause 6.4.3.5]

The following abnormal cases can be identified:

- b) Collision of UE-requested PDU session release procedure and network-requested PDU session modification procedure.
- When the UE receives a PDU SESSION MODIFICATION COMMAND message during the UE-requested PDU session release procedure, and the PDU session indicated in PDU SESSION MODIFICATION COMMAND message is the PDU session that the UE had requested to release, the UE shall ignore the PDU SESSION MODIFICATION COMMAND message and proceed with the PDU session release procedure.

10.1.6.1.3

Test description

10.1.6.1.3.1

Pre-test conditions

System Simulator:

- NGC Cell A.

UE:

None.

Preamble:

The UE is in state 3N-A on NGC Cell A according to TS 38.508-1 [4].

10.1.6.1.3.2

Test procedure sequence

Table 10.1.6.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to request establishment of PDU session to the DN.(Note 1)	-	-	-	-
2	The PDU session establishment procedure as specified in TS 38.508-1 [4] subclause 4.5A.2 take place.	-	-	-	-
3	Cause the UE to request release of PDU session established during step 2.(Note 2)	-	-	-	-
4	The UE transmits a PDU SESSION RELEASE REQUEST message.	-->	PDU SESSION RELEASE REQUEST	-	-
5	The SS transmits a PDU SESSION MODIFICATION COMMAND message.	<--	PDU SESSION MODIFICATION COMMAND	-	-
6	Check: Does the UE transmit a PDU SESSION MODIFICATION COMPLETE or PDU SESSION MODIFICATION COMMAND REJECT message in the next 3 seconds?	-	-	1	F
7	Check: Does the UE perform PDU session release procedure defined in clause 4.9.21 of TS 38.508-1 [4]?	-	-	1	P
8	Void	-	-		
Note 1: The request to establish a PDU session may be performed by MMI or AT command.					
Note 2: The request to release a PDU session may be performed by MMI.					

10.1.6.1.3.3

Specific message contents

Table 10.1.6.1.3.3-1: PDU SESSION RELEASE REQUEST (step 4, Table 10.1.6.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-12			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.1.6.1.3.2-1		
PTI	Any value from 1 to 254		

Table 10.1.6.1.3.3-2: PDU SESSION MODIFICATION COMMAND (step 5, Table 10.1.6.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-9			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.1.6.1.3.2-1		
PTI	'0000 0000'B	No procedure transaction identity assigned	

Table 10.1.6.1.3.3-3: PDU SESSION RELEASE COMMAND (step 7, Table 10.1.6.1.3.2-1; step 1, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	Same ID as the ID UE requested in step 2 in Table 10.1.6.1.3.2-1		
PTI	The value indicated in PDU SESSION RELEASE REQUEST		
5GSM cause	'0010 0100'B	#36 regular deactivation	

Table 10.1.6.1.3.3-4: PDU SESSION RELEASE COMPLETE (step 8, Table 10.1.6.1.3.2-1; step 2, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-15			
Information Element	Value/remark	Comment	Condition
PDU session ID	Same ID as the ID UE requested in step 2 in Table 10.1.6.1.3.2-1		
PTI	The value indicated in PDU SESSION RELEASE REQUEST		

10.1.6.2 UE-requested PDU session release / Abnormal / Collision with network-requested PDU session release procedure

10.1.6.2.1 Test Purpose (TP)

(1)

**with** { the UE is in PDU SESSION ACTIVE state and transported the PDU SESSION RELEASE REQUEST message }

**ensure that** {

**when** { UE receives a PDU SESSION RELEASE COMMAND message with the PTI IE set to “No procedure transaction identity assigned” indicating a PDU session that UE wants to release }

**then** { the UE aborts the UE-requested PDU session release procedure and proceeds with the network-requested PDU session release procedure }

}

10.1.6.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clause 6.4.3.2, 6.4.3.3 and 6.4.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.4.3.2]

In order to initiate the UE-requested PDU session release procedure, the UE shall create a PDU SESSION RELEASE REQUEST message.

The UE may set the 5GSM cause IE of the PDU SESSION RELEASE REQUEST message to indicate the reason for releasing the PDU session.

The 5GSM cause IE typically indicates one of the following 5GSM cause values:

- #36    regular deactivation;
- #41    Semantic error in the TFT operation;
- #42    Syntactical error in the TFT operation;
- #44    Semantic errors in packet filter(s);
- #45    Syntactical error in packet filter(s).

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION RELEASE REQUEST message to the allocated PTI value.

The UE shall transport the PDU SESSION RELEASE REQUEST message and the PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, and the UE shall start timer T3582 (see example in figure 6.4.3.2.1).

[TS 24.501, clause 6.4.3.3]

Upon receipt of a PDU SESSION RELEASE REQUEST message and a PDU session ID, if the SMF accepts the request to release the PDU session, and shall perform the network-requested PDU session release procedure as specified in subclause 6.3.3.

[TS 24.501, clause 6.4.3.5]

The following abnormal cases can be identified:

...

- c) Collision of UE-requested PDU session release procedure and network-requested PDU session release procedure.  
  
When the UE receives a PDU SESSION RELEASE COMMAND message with the PTI IE set to "No procedure transaction identity assigned" during the UE-requested PDU session release procedure, and the PDU session indicated in the PDU SESSION RELEASE COMMAND message is the same as the PDU session that the UE requests to release, the UE shall abort the UE-requested PDU session release procedure and proceed with the network-requested PDU session release procedure.

**10.1.6.2.3            Test description**

**10.1.6.2.3.1        Pre-test conditions**

**System Simulator:**

- NGC Cell A.

**UE:**

None.

**Preamble:**

- The UE is in state 3N-A on NGC Cell A according to TS 38.508-1 [4].



10.1.6.2.3.2

Test procedure sequence

Table 10.1.6.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to request establishment of PDU session to the DN.(Note 1)	-	-	-	-
2	The PDU session establishment procedure as specified in TS 38.508-1 [4] subclause 4.5A.2 take place.	-	-	-	-
3	Cause the UE to request release of PDU session established during step 2.(Note 2)	-	-	-	-
4	The UE transmits a PDU SESSION RELEASE REQUEST message.	-->	PDU SESSION RELEASE REQUEST	-	-
5	Check: Does the UE perform PDU session release procedure defined in clause 4.9.21 of TS 38.508-1 [4]?	-	-	1	P
6	Void	-	-	-	-
Note 1: The request to establish a PDU session may be performed by MMI or AT command.					
Note 2: The request to release a PDU session may be performed by MMI.					

10.1.6.2.3.3

Specific message contents

Table 10.1.6.2.3.3-1: PDU SESSION RELEASE REQUEST (step 4, Table 10.1.6.2.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-12			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.1.6.2.3.2-1		
PTI	Any value from 1 to 254		

Table 10.1.6.2.3.3-2: PDU SESSION RELEASE COMMAND (step 5, Table 10.1.6.2.3.2-1; step 1, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.1.6.2.3.2-1		
PTI	'0000 0000'B	No procedure transaction identity assigned	
5GSM cause	'0010 0100'B	#36 regular deactivation	

Table 10.1.6.2.3.3-3: PDU SESSION RELEASE COMPLETE (step 6, Table 10.1.6.2.3.2-1; step 2, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-15			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.1.6.2.3.2-1		
PTI	'0000 0000'B	unassigned	

## 10.2 EN-DC session management

### 10.2.1 Network initiated procedures

#### 10.2.1.1 Default EPS bearer context activation

##### 10.2.1.1.1 Test Purpose (TP)

(1)

```
with { UE has sent a PDN CONNECTIVITY REQUEST message }

ensure that {

    when { UE receives an RRCConnectionReconfiguration message including an ACTIVATE DEFAULT EPS
    BEARER CONTEXT REQUEST message with IE Procedure transaction identity matching the PDN CONNECTIVITY
    REQUEST message and including the Extended APN-AMBR IE }

    then { UE transmits an ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message and enters BEARER
    CONTEXT ACTIVE state }

}
```

##### 10.2.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.301, clause 6.4.1.3, 8.3.6.17 and 9.9.4.29. Unless otherwise stated these are Rel-15 requirements.

[TS 24.301, clause 6.4.1.3]

Upon receipt of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, if the UE provided an APN for the establishment of the PDN connection, the UE shall stop timer T3396 if it is running for the APN provided by the UE. If the UE did not provide an APN for the establishment of the PDN connection and the request type was different from "emergency" and from "handover of emergency bearer services", the UE shall stop the timer T3396 associated with no APN if it is running. If the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message was received in response to a request for an emergency PDN connection, the UE shall not stop the timer T3396 associated with no APN if it is running. For any case, the UE shall then send an ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message and enter the state BEARER CONTEXT ACTIVE. When the default bearer is activated as part of the attach procedure, the UE shall send the ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message together with ATTACH COMPLETE message. When the default bearer is activated as the response to the stand-alone PDN CONNECTIVITY REQUEST message, the UE shall send the ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message alone.

If a WLAN offload indication information element is included in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the WLAN offload acceptability values for this PDN connection and use the E-UTRAN offload acceptability value to determine whether this PDN connection is offloadable to WLAN or not.

The UE checks the PTI in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message to identify the UE requested PDN connectivity procedure to which the default bearer context activation is related (see subclause 6.5.1).

If the UE receives a serving PLMN rate control IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the serving PLMN rate control IE value and use the stored serving PLMN rate control value as the maximum allowed limit of uplink User data container IEs included in ESM DATA TRANSPORT messages for the corresponding PDN connection in accordance with 3GPP TS 23.401 [10].

If the UE receives an APN rate control parameters container in the protocol configuration options IE or extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the APN rate control parameters value and use the stored APN rate control parameters value as the maximum allowed limit of uplink user data related to the APN indicated in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored APN rate control parameters value for this APN, the UE shall replace the stored APN rate control parameters value for this APN with the received APN rate control parameters value.

If the UE receives an additional APN rate control parameters for exception data container in the protocol configuration options IE or extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the additional APN rate control parameters for exception data value and use the stored additional APN rate control parameters for exception data value as the maximum allowed limit of uplink exception data related to the APN indicated in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored additional APN rate control parameters for exception data value for this APN, the UE shall replace the stored additional APN rate control parameters for exception data value for this APN with the received additional APN rate control parameters for exception data value.

If the UE receives non-IP Link MTU parameter or IPv4 Link MTU parameter of the protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall pass the received Non-IP Link MTU or IPv4 Link MTU to the upper layer.

NOTE: The Non-IP Link MTU and the IPv4 Link MTU size correspond to the maximum length of user data that can be sent either in the user data container in the ESM DATA TRANSPORT message or via S1-U interface.

If the UE receives a session-AMBR and QoS rule(s), which correspond to the default EPS bearer of the PDN connectivity being activated, in the protocol configuration options IE or the extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE stores the session-AMBR and QoS rule(s) for use during inter-system change from S1 mode to N1 mode.

Upon receipt of the ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message, the MME shall enter the state BEARER CONTEXT ACTIVE and stop the timer T3485, if the timer is running. If the PDN CONNECTIVITY REQUEST message included a low priority indicator set to "MS is configured for NAS signalling low priority", the MME shall store the NAS signalling low priority indication within the default EPS bearer context.

[TS 24.301, clause 8.3.6.17]

This IE shall be included in the message only if the network wishes to transmit the APN-AMBR values to the UE for possible uplink policy enforcement and at least one of the values to be transmitted exceeds the maximum value specified in the APN aggregate maximum bit rate information element in subclause 9.9.4.2.

[TS 24.301, clause 9.9.4.29]

The purpose of the extended APN aggregate maximum bit rate information element is to indicate the initial subscribed APN-AMBR with a value higher than 65280 Mbps when the UE establishes a PDN connection or to indicate the new APN-AMBR with a value higher than 65280 Mbps if it is changed by the network.

The receiving entity shall ignore the bit rate values which are included in the extended APN aggregate maximum bit rate information element and not higher than 65280 Mbps.

The extended APN aggregate maximum bit rate information element is coded as shown in figure 9.9.4.29.1 and table 9.9.4.29.1.

The extended APN aggregate maximum bit rate is a type 4 information element with a length of 8 octets.

8	7	6	5	4	3	2	1	
Extended APN aggregate maximum bit rate IEI								octet 1
Length of extended APN aggregate maximum bit rate contents								octet 2
Unit for extended APN-AMBR for downlink								octet 3
Extended APN-AMBR for downlink								octet 4
Extended APN-AMBR for downlink (continued)								octet 5
Unit for extended APN-AMBR for uplink								octet 6
Extended APN-AMBR for uplink								octet 7
Extended APN-AMBR for uplink (continued)								octet 8

Figure 9.9.4.29.1: Extended APN aggregate maximum bit rate information element

Table 9.9.4.29.1: Extended APN aggregate maximum bit rate information element

Unit for extended APN-AMBR for downlink (octet 3)	
0 0 0 0 0 0 0 0	value is not used
0 0 0 0 0 0 0 1	value is not used
0 0 0 0 0 0 1 0	value is not used
0 0 0 0 0 0 1 1	value is incremented in multiples of 4 Mbps
0 0 0 0 0 1 0 0	value is incremented in multiples of 16 Mbps
0 0 0 0 0 1 0 1	value is incremented in multiples of 64 Mbps
0 0 0 0 0 1 1 0	value is incremented in multiples of 256 Mbps
0 0 0 0 0 1 1 1	value is incremented in multiples of 1 Gbps
0 0 0 0 1 0 0 0	value is incremented in multiples of 4 Gbps
0 0 0 0 1 0 0 1	value is incremented in multiples of 16 Gbps
0 0 0 0 1 0 1 0	value is incremented in multiples of 64 Gbps
0 0 0 0 1 0 1 1	value is incremented in multiples of 256 Gbps
0 0 0 0 1 1 0 0	value is incremented in multiples of 1 Tbps
0 0 0 0 1 1 0 1	value is incremented in multiples of 4 Tbps
0 0 0 0 1 1 1 0	value is incremented in multiples of 16 Tbps
0 0 0 0 1 1 1 1	value is incremented in multiples of 64 Tbps
0 0 0 1 0 0 0 0	value is incremented in multiples of 256 Tbps
0 0 0 1 0 0 0 1	value is incremented in multiples of 1 Pbps
0 0 0 1 0 0 1 0	value is incremented in multiples of 4 Pbps
0 0 0 1 0 0 1 1	value is incremented in multiples of 16 Pbps
0 0 0 1 0 1 0 0	value is incremented in multiples of 64 Pbps
0 0 0 1 0 1 0 1	value is incremented in multiples of 256 Pbps
Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.	
Extended APN-AMBR for downlink (octets 4 and 5)	
Octets 4 and 5 represent the binary coded value of extended APN-AMBR for downlink in units defined by octet 3	
Unit for extended APN-AMBR for uplink (octet 6)	
The coding is identical to that of the unit for extended APN-AMBR for downlink (octet 3)	
Extended APN-AMBR for uplink (octets 7 and 8)	
Octets 7 and 8 represent the binary coded value of extended APN-AMBR for uplink in units defined by octet 6.	

10.2.1.1.3

Test description

10.2.1.1.3.1

Pre-test conditions

System Simulator:

- E-UTRA Cell 1 is the PCell and NR Cell 1 is the PSCell.

UE:

None.

Preamble:

- The UE is in RRC\_IDLE state on E-UTRA Cell 1 using generic procedure parameter Connectivity (*EN-DC*) and Bearers (*MCG only*) established according to TS 38.508-1 [4].

10.2.1.1.3.2

Test procedure sequence

Table 10.2.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	Cause the UE to request connectivity to an additional PDN (see Note 1)	-	-	-	-
2	UE transmit an <i>RRCCONNECTIONREQUEST</i> message with <i>establishmentCause</i> set to 'mo-Data' followed by a SERVICE REQUEST message.	-->	SERVICE REQUEST	-	-
3	The SS establishes SRB2 and DRB associated with default EPS bearer context (a first PDN obtained during the attach procedure).	-	-	-	-
4	The UE transmit a PDN CONNECTIVITY REQUEST message as specified to request an additional PDN.	-->	PDN CONNECTIVITY REQUEST	-	-
5	The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message containing NR <i>RRCReconfiguration</i> message to add <i>NR PSCell</i> with SCG DRB. The <i>RRCCONNECTIONRECONFIGURATION</i> message contains ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message containing Extended APN-AMBR IE.	<--	RRC: <i>RRCCONNECTIONRECONFIGURATION</i> (( <i>RRCReconfiguration</i> ) NAS: ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST	-	-
6	The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message to confirm the establishment of default bearer.	-->	RRC: <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> ( <i>RRCReconfigurationComplete</i> )	-	-
-	EXCEPTION: In parallel to the event described in step 7 below, if initiated by the UE the generic procedure for IP address allocation in the U-plane specified in TS 36.508 subclause 4.5A.1 takes place performing IP address allocation in the U-plane.	-	-	-	-
7	The UE transmits ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message.	-->	RRC: <i>ULInformationTransfer</i> NAS: ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT	1	P

Note 1: The request of connectivity to an additional PDN may be performed by MMI or AT command.

10.2.1.1.3.3 Specific message contents

Table 10.2.1.1.3.3-1: PDN CONNECTIVITY REQUEST (step 4, Table 10.2.1.1.3.2-1)

Derivation path: TS 36.508 [7], Table 4.7.3-20			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	ESM		
EPS bearer identity	0	No EPS bearer identity assigned	
Procedure transaction identity	PTI-1	UE assigns a particular PTI not yet used between 1 and 254	
Access point name	APN-1(New PDN name)	The requested PDN is different from default PDN	

Table 10.2.1.1.3.3-2: ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST (step 5, Table 10.2.1.1.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.3-6			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	ESM		
EPS bearer identity	6		
Procedure transaction identity	PTI-1	SS re-uses the particular PTI defined by UE for this present additional PDN connectivity request procedure.	
EPS QoS			
QCI	8		
Maximum bit rate for uplink	384 kbps		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	128 kbps		
Guaranteed bit rate for downlink	128 kbps		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
APN-AMBR			
APN-AMBR for downlink	'11111110'B (8640 kbps)		
APN-AMBR for uplink	'11111110'B (8640 kbps)		
APN-AMBR for downlink (extended)	'11111010' B(256 Mbps)		
APN-AMBR for uplink (extended)	'11111010' B(256 Mbps)		
APN-AMBR for downlink (extended-2)	'11111110'B (65280 Mbps)		
APN-AMBR for uplink (extended-2)	0		
Access point name	APN-1	SS re-uses the particular APN defined by UE for this present additional PDN connectivity request procedure	
Extended APN-AMBR			
Unit for extended APN-AMBR for downlink	'00000111'B (value is incremented in multiples of 1 Gbps)		
Extended APN-AMBR for downlink	'0000000010000000' (128 Gbps)		
Unit for extended APN-AMBR for uplink	0		
Extended APN-AMBR for uplink	0		

10.2.1.2      **Dedicated EPS bearer context activation**

10.2.1.2.1              **Test Purpose (TP)**

**(1)**

```
with { UE in EMM-REGISTERED state }

ensure that {

    when { UE receives an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, including the
Extended EPS QoS IE, linked to the existing default EPS bearer }

        then { UE transmits an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT }

}
```

**(2)**

```
with { the UE in BEARER CONTEXT ACTIVE STATE and in EMM-CONNECTED mode }

ensure that {

    when { the UE receives a MODIFY EPS BEARER CONTEXT REQUEST message including the Extended EPS QoS
and Extended APN-AMBR IEs }

        then { UE transmits a MODIFY EPS BEARER CONTEXT ACCEPT }

}
```

10.2.1.2.2              **Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.301, clauses 6.4.2.3, 6.4.3.1, 6.4.3.2, 6.4.3.3, 8.3.3.11, 9.9.4.29 and 9.9.4.30. Unless otherwise stated these are Rel-15 requirements.

[TS 24.301, clause 6.4.2.3]

Upon receipt of the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, if the UE provided an APN for the establishment of the PDN connection, the UE shall stop timer T3396, if it is running for the APN provided by the UE. If the UE did not provide an APN for the establishment of the PDN connection and the request type was different from "emergency" and from "handover of emergency bearer services", the UE shall stop the timer T3396 associated with no APN if it is running. If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message was received for an emergency PDN connection, the UE shall not stop the timer T3396 associated with no APN if it is running. For any case, the UE shall then check the received TFT before taking it into use, send an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message and enter the state BEARER CONTEXT ACTIVE. The ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message shall include the EPS bearer identity.

The linked EPS bearer identity included in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message indicates to the UE to which default bearer, IP address and PDN the dedicated bearer is linked.

If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]), the UE uses the PTI to identify the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure to which the dedicated bearer context activation is related.

[TS 24.301, clause 6.4.3.1]



The purpose of the EPS bearer context modification procedure is to modify an EPS bearer context with a specific QoS and TFT, or re-negotiate header compression configuration associated to an EPS bearer context. The EPS bearer context modification procedure is initiated by the network, but it may also be initiated as part of the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure.

The network may also initiate the EPS bearer context modification procedure to update the APN-AMBR of the UE, for instance after an inter-system handover. See 3GPP TS 23.401 [10] annex E.

[TS 24.301, clause 6.4.3.2]

The MME shall initiate the EPS bearer context modification procedure by sending a MODIFY EPS BEARER CONTEXT REQUEST message to the UE, starting the timer T3486, and entering the state BEARER CONTEXT MODIFY PENDING (see example in figure 6.4.3.2.1).

The MME shall include an EPS bearer identity that identifies the EPS bearer context to be modified in the MODIFY EPS BEARER CONTEXT REQUEST message.

[TS 24.301, clause 6.4.3.3]

Upon receipt of the MODIFY EPS BEARER CONTEXT REQUEST message, if the UE provided an APN for the establishment of the PDN connection, the UE shall stop timer T3396, if it is running for the APN provided by the UE. If the UE did not provide an APN for the establishment of the PDN connection and the request type was different from "emergency" and from "handover of emergency bearer services", the UE shall stop the timer T3396 associated with no APN if it is running. If the MODIFY EPS BEARER CONTEXT REQUEST message was received for an emergency PDN connection, the UE shall not stop the timer T3396 associated with no APN if it is running. For any case, the UE shall then check the received TFT before taking it into use and send a MODIFY EPS BEARER CONTEXT ACCEPT message to the MME.

If the MODIFY EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]), the UE uses the PTI to identify the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure to which the EPS bearer context modification is related (see subclause 6.5.3 and subclause 6.5.4).

If the MODIFY EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]) and the PTI is associated to a UE requested bearer resource allocation procedure or a UE requested bearer resource modification procedure, the UE shall release the traffic flow aggregate description associated to the PTI value provided.

...

Upon receipt of the MODIFY EPS BEARER CONTEXT ACCEPT message, the MME shall stop the timer T3486 and enter the state BEARER CONTEXT ACTIVE.

[TS 24.301, clause 8.3.3.11]

This IE shall be included in the message only if the network wishes to transmit the maximum and guaranteed bit rate values to the UE and at least one of the values to be transmitted exceeds the maximum value specified in the EPS quality of service information element in subclause 9.9.4.3

[TS 24.301, clause 9.9.4.29]

The purpose of the extended APN aggregate maximum bit rate information element is to indicate the initial subscribed APN-AMBR with a value higher than 65280 Mbps when the UE establishes a PDN connection or to indicate the new APN-AMBR with a value higher than 65280 Mbps if it is changed by the network.

The receiving entity shall ignore the bit rate values which are included in the extended APN aggregate maximum bit rate information element and not higher than 65280 Mbps.

The extended APN aggregate maximum bit rate information element is coded as shown in figure 9.9.4.29.1 and table 9.9.4.29.1.

The extended APN aggregate maximum bit rate is a type 4 information element with a length of 8 octets

[TS 24.301, clause 9.9.4.30]

The purpose of the Extended EPS quality of service information element is to indicate for an EPS bearer context the maximum bit rates for uplink and downlink and the guaranteed bit rates for uplink and downlink, if at least one of the bit rates has a value higher than 10 Gbps.

The Extended EPS quality of service information element is coded as shown in figure 9.9.4.30.1 and table 9.9.4.30.1. For uplink and downlink, if sending entity only has to indicate one bit rate (i.e., with a value higher than 10 Gbps), it shall encode the other bit rate (i.e., with a value smaller or equal to 10 Gbps) as "00000000". The receiving entity shall ignore the bit rate which is included in the extended quality of service information element and has a value smaller or equal to 10 Gbps.

10.2.1.2.3

Test description

10.2.1.2.3.1

Pre-test conditions

System Simulator:

- E-UTRA Cell 1 is the PCell and NR Cell 1 is the PSCell.

UE:

- None.

Preamble:

- The UE is in RRC\_IDLE state on E-UTRA Cell 1 using generic procedure parameter Connectivity (EN-DC) according to TS 38.508-1 [4].

10.2.1.2.3.2

Test procedure sequence

Table 10.2.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1-6	Steps 1 to 6 of generic procedure defined in clause 4.5.4 in TS 38.508-1 [4].	-	-	-	-
7	The SS configures a dedicated EPS bearer associated with the default EPS bearer context by sending ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST including the Extended QoS IE. (See Note 1 and Note 2).	<--	NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	-	-
8	Check: Does the UE transmit an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message as specified?	-->	ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	1	P
9	The SS transmits a MODIFY EPS BEARER CONTEXT REQUEST message with Extended EPS QoS and Extended APN-AMBR IEs. This message is included in a DLInformationTransfer message.	<--	MODIFY EPS BEARER CONTEXT REQUEST	-	-
10	Check: Does the UE transmit a MODIFY EPS BEARER CONTEXT ACCEPT message?	-->	MODIFY EPS BEARER CONTEXT ACCEPT	2	P
Note 1: The ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message is included in a <i>RRConnectionReconfiguration</i> message including a DRB setup for the same EPS bearer ID.					
Note 2: The <i>RRConnectionReconfiguration</i> uses the condition for DC bearer MCG and SCG					

10.2.1.2.3.3 Specific message contents

Table 10.2.1.2.3.3-1: ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST (step 7, Table 10.2.1.2.3.2-1)

Derivation Path: TS 38.508-1[4], Table 4.5.4.3-1			
Information Element	Value/remark	Comment	Condition
Protocol discriminator	ESM		
EPS bearer identity	6		
Procedure transaction identity	'0000 0000'B	No procedure transaction identity assigned	
EPS QoS			
QCI	8		
Maximum bit rate for uplink	'01101000'B (384) kbps		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	'01001000'B (128 kbps)		
Guaranteed bit rate for downlink	'01001000'B (128 kbps)		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
Extended EPS QoS			
Unit for maximum bit rate	'00000111' (value is incremented in multiples of 1 Gbps)		
Maximum bit rate for uplink	'0000000000000000'B		
Maximum bit rate for downlink	'0000000000001100'B (12 Gbps)		
Unit for guaranteed bit rate	'00000000'B		
Guaranteed bit rate for uplink	'00000000'B		
Guaranteed bit rate for downlink	'00000000'B		

Table 10.2.1.2.3.3-2: MODIFY EPS BEARER CONTEXT REQUEST (step 9, Table 10.2.1.2.3.2-1)

Derivation path: TS 36.508 [7], Table 4.7.3-18			
Information Element	Value/Remark	Comment	Condition
New EPS QoS			
QCI	8		
Maximum bit rate for uplink	'01101000'B (384 kbps)		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	'01001000'B (128 kbps)		
Guaranteed bit rate for downlink	'01001000'B (128 kbps)		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
APN-AMBR			
APN-AMBR for downlink	'11111110'B (8640 kbps)		
APN-AMBR for uplink	'11111110'B (8640 kbps)		
APN-AMBR for downlink (extended)	'11111010' B(256 Mbps)		
APN-AMBR for uplink (extended)	'11111010' B(256 Mbps)		
APN-AMBR for downlink (extended-2)	'11111110'B (65280 Mbps)		
APN-AMBR for uplink (extended-2)	0		
Extended APN-AMBR			
Unit for extended APN-AMBR for downlink	'00000111'B (value is incremented in multiples of 1 Gbps)		
Extended APN-AMBR for downlink	'0000000010000000' (128 Gbps)		
Unit for extended APN-AMBR for uplink	0		
Extended APN-AMBR for uplink	0		
Extended EPS QoS			
Unit for maximum bit rate	'00000111' (value is incremented in multiples of 1 Gbps)		
Maximum bit rate for uplink	'0000000000000000'B		
Maximum bit rate for downlink	'000000000001110'B		
Unit for guaranteed bit rate	'00000000'B		
Guaranteed bit rate for uplink	'00000000'B		
Guaranteed bit rate for downlink	'00000000'B		

10.2.2 UE initiated procedures

10.2.2.1 EPS bearer resource allocation / modification

10.2.2.1.1 Test Purpose (TP)

(1)

with { UE in PROCEDURE TRANSACTION INACTIVE state and in EMM-IDLE mode }

ensure that {

when { UE is requested to allocate bearer resource using Extended EPS QoS }

then { UE sends a BEARER RESOURCE ALLOCATION REQUEST including the Extended EPS QoS IE }

}

(2)

with { UE has sent the BEARER RESOURCE ALLOCATION REQUEST message }

ensure that {

when { UE receives an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message with the procedure transaction identity (PTI) indicated in the BEARER RESOURCE ALLOCATION REQUEST message }

then { UE sends an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message }

}

(3)

with { UE in PROCEDURE TRANSACTION INACTIVE state and in EMM-CONNECTED mode }

ensure that {

when { UE is requested to modify of bearer resource corresponding to the dedicated bearer using Extended EPS QoS }

then { UE sends a BEARER RESOURCE MODIFICATION REQUEST message including the Extended EPS QoS IE }

}

(4)

with { UE having sent the BEARER RESOURCE MODIFICATION REQUEST message }

ensure that {

when { UE receives an MODIFY EPS BEARER CONTEXT REQUEST message with the procedure transaction identity (PTI) indicated in the BEARER RESOURCE MODIFICATION REQUEST message }

then { UE sends a MODIFY EPS BEARER CONTEXT ACCEPT message }

}

10.2.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.301, clauses 6.4.2.3, 6.5.3.2, 6.5.3.3, 6.5.4.2, 6.5.4.3, 8.3.8, 8.3.10 and 9.9.4.30. Unless otherwise stated these are Rel-15 requirements.

[TS 24.301, clause 6.4.2.3]

The linked EPS bearer identity included in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message indicates to the UE to which default bearer, IP address and PDN the dedicated bearer is linked.

If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]), the UE uses the PTI to identify the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure to which the dedicated bearer context activation is related.

[TS 24.301, clause 6.5.3.2]

In order to request the allocation of bearer resources for one traffic flow aggregate, the UE shall send a BEARER RESOURCE ALLOCATION REQUEST message to the MME, start timer T3480 and enter the state PROCEDURE TRANSACTION PENDING (see example in figure 6.5.3.2.1).

The UE shall include the EPS bearer identity of the default EPS bearer associated with the requested bearer resource in the Linked EPS bearer identity IE. The UE shall set the TFT operation code in the Traffic flow aggregate IE to "Create new TFT". The packet filters in the Traffic flow aggregate IE shall include at least one packet filter applicable for the uplink direction. In the Required traffic flow QoS IE, the UE shall indicate a QCI and, if the UE also includes a GBR, the additional GBR required for the traffic flow aggregate.

[TS 24.301, clause 6.5.3.3]

If the bearer resource allocation requested is accepted by the network, the MME shall initiate either a dedicated EPS bearer context activation procedure or an EPS bearer context modification procedure. Upon receipt of an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST or MODIFY EPS BEARER CONTEXT REQUEST message with a PTI which matches the value used for the BEARER RESOURCE ALLOCATION REQUEST message, the UE shall stop timer T3480 and enter the state PROCEDURE TRANSACTION INACTIVE. The UE should ensure that the procedure transaction identity (PTI) assigned to this procedure is not released immediately. The way to achieve this is implementation dependent. While the PTI value is not released, the UE regards any received ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST or MODIFY EPS BEARER CONTEXT REQUEST message with the same PTI value as a network retransmission (see subclause 7.3.1).

If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message is received, the UE shall verify that the EPS bearer identity given in the EPS bearer identity IE is not already used by any EPS bearer context. The UE shall then proceed as described in subclause 6.4.2.3 or subclause 6.4.2.4.

[TS 24.301, clause 6.5.4.2]

In order to request the modification of bearer resources for one traffic flow aggregate, the UE shall send a BEARER RESOURCE MODIFICATION REQUEST message to the MME, start timer T3481 and enter the state PROCEDURE TRANSACTION PENDING (see example in figure 6.5.4.2.1).

[TS 24.301, clause 6.5.4.3]

Upon receipt of the BEARER RESOURCE MODIFICATION REQUEST message, the MME checks whether the resources requested by the UE can be established, modified or released by verifying the EPS bearer identity given in the EPS bearer identity for packet filter IE.

If the bearer resource modification requested is accepted by the network, the MME shall initiate either a dedicated EPS bearer context activation procedure, an EPS bearer context modification procedure or an EPS bearer context deactivation procedure.

...

Upon receipt of an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST, MODIFY EPS BEARER CONTEXT REQUEST or DEACTIVATE EPS BEARER CONTEXT REQUEST message with a PTI which matches the value used for the BEARER RESOURCE MODIFICATION REQUEST message, the UE shall stop timer T3481 and enter the state PROCEDURE TRANSACTION INACTIVE. The UE should ensure that the procedure transaction identity (PTI) assigned to this procedure is not released immediately. The way to achieve this is implementation dependent. While the PTI value is not released, the UE regards any received ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST or MODIFY EPS BEARER CONTEXT REQUEST message with the same PTI value as a network retransmission (see subclause 7.3.1).

- i) If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message is received, the UE shall verify that the EPS bearer identity given in the EPS bearer identity IE is not already used by any EPS bearer context. The UE shall then proceed as described in subclause 6.4.2.3 or subclause 6.4.2.4.

[TS 24.301, clause 8.3.8]

This IE shall be included in the message only if the UE wishes to transmit the maximum and guaranteed bit rate values to the network and at least one of the values to be transmitted exceeds the maximum value specified in the EPS quality of service information element in subclause 9.9.4.3.

[TS 24.301, clause 8.3.10]

This IE shall be included in the message only if the UE wishes to transmit the maximum and guaranteed bit rate values to the network and at least one of the values to be transmitted exceeds the maximum value specified in the EPS quality of service information element in subclause 9.9.4.3.

[TS 24.301, clause 9.9.4.30]

The purpose of the Extended quality of service information element is to indicate for an EPS bearer context the maximum bit rates for uplink and downlink and the guaranteed bit rates for uplink and downlink, if at least one of the bit rates has a value higher than 10 Gbps.

The Extended quality of service information element is coded as shown in figure 9.9.4.30.1 and table 9.9.4.30.1. For uplink and downlink, if the sending entity only has to indicate one bit rate (i.e., with a value higher than 10 Gbps), it shall encode the other bit rate (i.e., with a value smaller or equal to 10 Gbps) as "00000000". The receiving entity shall ignore a bit rate which is included in the extended quality of service information element and has a value smaller or equal to 10 Gbps.

The Extended quality of service is a type 4 information element with a length of 12 octets.

8	7	6	5	4	3	2	1	
Extended quality of service IEI								octet 1
Length of Extended quality of service contents								octet 2
Unit for maximum bit rate								octet 3
Maximum bit rate for uplink								octet 4
Maximum bit rate for uplink (continued)								octet 5
Maximum bit rate for downlink								octet 6
Maximum bit rate for downlink (continued)								octet 7
Unit for guaranteed bit rate								octet 8
Guaranteed bit rate for uplink								octet 9
Guaranteed bit rate for uplink (continued)								octet 10
Guaranteed bit rate for downlink								octet 11
Guaranteed bit rate for downlink (continued)								octet 12

Figure 9.9.4.30.1: Extended quality of service information element

Table 9.9.4.30.1: Extended quality of service information element

Unit for maximum bit rate (octet 3)	
0 0 0 0 0 0 0 0	value is not used
0 0 0 0 0 0 0 1	value is incremented in multiples of 200 kbps
0 0 0 0 0 0 1 0	value is incremented in multiples of 1 Mbps
0 0 0 0 0 0 1 1	value is incremented in multiples of 4 Mbps
0 0 0 0 0 1 0 0	value is incremented in multiples of 16 Mbps
0 0 0 0 0 1 0 1	value is incremented in multiples of 64 Mbps
0 0 0 0 0 1 1 0	value is incremented in multiples of 256 Mbps
0 0 0 0 0 1 1 1	value is incremented in multiples of 1 Gbps
0 0 0 0 1 0 0 0	value is incremented in multiples of 4 Gbps
0 0 0 0 1 0 0 1	value is incremented in multiples of 16 Gbps
0 0 0 0 1 0 1 0	value is incremented in multiples of 64 Gbps
0 0 0 0 1 0 1 1	value is incremented in multiples of 256 Gbps
0 0 0 0 1 1 0 0	value is incremented in multiples of 1 Tbps
0 0 0 0 1 1 0 1	value is incremented in multiples of 4 Tbps
0 0 0 0 1 1 1 0	value is incremented in multiples of 16 Tbps
0 0 0 0 1 1 1 1	value is incremented in multiples of 64 Tbps
0 0 0 1 0 0 0 0	value is incremented in multiples of 256 Tbps
0 0 0 1 0 0 0 1	value is incremented in multiples of 1 Pbps
0 0 0 1 0 0 1 0	value is incremented in multiples of 4 Pbps
0 0 0 1 0 0 1 1	value is incremented in multiples of 16 Pbps
0 0 0 1 0 1 0 0	value is incremented in multiples of 64 Pbps
0 0 0 1 0 1 0 1	value is incremented in multiples of 256 Pbps
Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.	
Maximum bit rate for uplink (octets 4 and 5)	
Octets 4 and 5 represent the binary coded value of maximum bit rate for uplink in units defined by octet 3.	
Maximum bit rate for downlink (octets 6 and 7)	
Octets 6 and 7 represent the binary coded value of maximum bit rate for downlink in units defined by octet 3.	
Unit for guaranteed bit rate (octet 8)	
The coding is identical to that of the unit for maximum bit rate (octet 3).	
Guaranteed bit rate for uplink (octets 9 and 10)	
Octets 9 and 10 represent the binary coded value of guaranteed bit rate for uplink in units defined by octet 8.	
Guaranteed bit rate for downlink (octets 11 and 12)	
Octets 11 and 12 represent the binary coded value of guaranteed bit rate for downlink in units defined by octet 8.	



10.2.2.1.3

Test description

10.2.2.1.3.1

Pre-test conditions

System Simulator:

- E-UTRA Cell 1 and NR Cell 1.

UE:

- None.

Preamble:

- The UE is in state RRC\_IDLE using generic procedure parameter Connectivity (*EN-DC*) according to [4].

10.2.2.1.3.2

Test procedure sequence

Table 10.2.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Cause the UE to request bearer resource allocation of dedicated EPS bearer associated with non-IMS PDN connectivity if pc_MULTI_PDN=TRUE else first PDN connectivity. (Note 1).	-	-	-	-
2	The UE transmits a SERVICE REQUEST message.	-->	SERVICE REQUEST	-	-
3	The SS establishes SRB2 and the MCG DRBs associated with the default EPS bearer context activated during the preamble.	-	-	-	-
4	Check: Does the UE transmit a BEARER RESOURCE ALLOCATION REQUEST message?	-->	BEARER RESOURCE ALLOCATION REQUEST	1	P
5	The SS transmits an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message and establishes a RLC-AM SCG DRB bearer using MCG and SCG condition.	<--	ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	-	-
6	Check: Does the UE transmit an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message?	-->	ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	2	P
7	Cause the UE to request bearer resource modification of dedicated EPS bearer associated with non-IMS PDN connectivity if pc_MULTI_PDN=TRUE else first PDN connectivity. (Note 2).	-	-	-	-
8	Check: Does the UE transmit a BEARER RESOURCE MODIFICATION REQUEST message?	-->	BEARER RESOURCE MODIFICATION REQUEST	3	P
9	The SS transmits an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message.	<--	MODIFY EPS BEARER CONTEXT REQUEST	-	-
10	Check: Does the UE transmit an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message?	-->	MODIFY EPS BEARER CONTEXT ACCEPT	4	P
Note 1: The request is assumed to be triggered by AT command +CGDSCONT, and +CGACT (activated).					
Note 2: The request is assumed to be triggered by AT command +CGCMOD.					

10.2.2.1.3.3 Specific message contents

Table 10.2.2.1.3.3-1: Message BEARER RESOURCE ALLOCATION REQUEST (step 4, Table 10.2.2.1.3.2-1)

Derivation path: TS 36.508 [7], Table 4.7.3-6B			
Information Element	Value/Remark	Comment	Condition

Linked EPS bearer identity	12		
EPS QoS			
QCI	1		
Maximum bit rate for uplink	384 kbps		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	128 kbps		
Guaranteed bit rate for downlink	128 kbps		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
Extended EPS QoS			
Unit for maximum bit rate	Any value(Note1)		
Maximum bit rate for uplink	'00000000'B		
Maximum bit rate for downlink	Any value(Note1)		
Unit for guaranteed bit rate	'00000000'B		
Guaranteed bit rate for uplink	'00000000'B		
Guaranteed bit rate for downlink	'00000000'B		
Note1: The product of Unit for maximum bit rate and maximum bit rate for downlink should be 12Gbps.			

Table 10.2.2.1.3.3-2: Message ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST (step 5, Table 10.2.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.5.4.3-1 , condition UE-INITIATED			
Information Element	Value/Remark	Comment	Condition
EPS bearer identity	6		
EPS QoS			
QCI	1		
Maximum bit rate for uplink	384 kbps		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	128 kbps		
Guaranteed bit rate for downlink	128 kbps		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
Extended EPS QoS			
Unit for maximum bit rate	'00000111' (value is incremented in multiples of 1 Gbps)		
Maximum bit rate for uplink	'00000000'B		
Maximum bit rate for downlink	'0000000000001100' B (12 Gbps)		
Unit for guaranteed bit rate	'00000000'B		
Guaranteed bit rate for uplink	'00000000'B		
Guaranteed bit rate for downlink	'00000000'B		

Table 10.2.2.1.3.3-3: Message BEARER RESOURCE MODIFICATION REQUEST (step 8, Table 10.2.2.1.3.2-1)

Derivation path: TS 36.508 [7], Table 4.7.3-8			
Information Element	Value/Remark	Comment	Condition

EPS bearer identity for packet filter	6		
Required traffic flow QoS			
QCI	1		
Maximum bit rate for uplink	384 kbps		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	128 kbps		
Guaranteed bit rate for downlink	128 kbps		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
Extended EPS QoS			
Unit for maximum bit rate	Any value (Note1)		
Maximum bit rate for uplink	'00000000'B		
Maximum bit rate for downlink	Any value (Note1)		
Unit for guaranteed bit rate	'00000000'B		
Guaranteed bit rate for uplink	'00000000'B		
Guaranteed bit rate for downlink	'00000000'B		
Note1: The product of Unit for maximum bit rate and maximum bit rate for downlink should be 16Gbps.			

Table 10.2.2.1.3.3-4: Message MODIFY EPS BEARER CONTEXT REQUEST (step 7, Table 10.2.2.1.3.2-1)

Derivation path: TS 36.508 [7], Table 4.7.3-18, condition UE-INITIATED			
Information Element	Value/Remark	Comment	Condition

EPS bearer identity	6		
Linked EPS bearer identity	12		
New EPS QoS			
QCI	1		
Maximum bit rate for uplink	384 kbps		
Maximum bit rate for downlink	'11111110'B (8640 kbps)		
Guaranteed bit rate for uplink	128 kbps		
Guaranteed bit rate for downlink	128 kbps		
Maximum bit rate for uplink (extended)	0		
Maximum bit rate for downlink (extended)	'11111010'B (256 Mbps)		
Guaranteed bit rate for uplink (extended)	0		
Guaranteed bit rate for downlink (extended)	0		
Maximum bit rate for uplink (extended-2)	0		
Maximum bit rate for downlink (extended-2)	'11110110'B (10 Gbps)		
Guaranteed bit rate for uplink (extended-2)	0		
Guaranteed bit rate for downlink (extended-2)	0		
APN-AMBR			
APN-AMBR for downlink	'11111110'B (8640 kbps)		
APN-AMBR for uplink	'11111110'B (8640 kbps)		
APN-AMBR for downlink (extended)	'11111010' B(256 Mbps)		
APN-AMBR for uplink (extended)	'11111010' B(256 Mbps)		
APN-AMBR for downlink (extended-2)	'11111110'B (65280 Mbps)		
APN-AMBR for uplink (extended-2)	0		
Extended APN-AMBR			
Unit for extended APN-AMBR for downlink	'00000111'B (value is incremented in multiples of 1 Gbps)		
Extended APN-AMBR for downlink	'0000000010000000' (128 Gbps)		
Unit for extended APN-AMBR for uplink	0		
Extended APN-AMBR for uplink	0		
Extended EPS QoS			
Unit for maximum bit rate	'00000111' (value is incremented in multiples of 1 Gbps)		
Maximum bit rate for uplink	'00000000'B		
Maximum bit rate for downlink	'0000000000010000' B (16 Gbps)		
Unit for guaranteed bit rate	'00000000'B		
Guaranteed bit rate for uplink	'00000000'B		
Guaranteed bit rate for downlink	'00000000'B		

10.3 5GS Non-3GPP Access Session Management

10.3.1 PDU session authentication and authorization

10.3.1.1 PDU session authentication and authorization / during the UE-requested PDU session procedure

10.3.1.1.1 Test Purpose (TP)

Same Test Purpose as in clause 10.1.1.1.1

10.3.1.1.2 Conformance requirements

Same conformance requirements as in clause 10.1.1.1.2

10.3.1.1.3

Test description

10.3.1.1.3.1

Pre-test conditions

System Simulator:

WLAN Cell 27

UE:

None.

Preamble:

The UE is in state 1W-A with PDU session Active state according to TS 38.508-1 [4].

10.3.1.1.3.2

Test procedure sequence

Table 10.3.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	Cause the UE to request connectivity to an additional PDU session. (see Note 1)	-	-	-	-
2	UE transmits establishes a IPSEC SA and NAS signalling connection as per generic procedure in table 4.5A.4.2.2-1 of 38.508-1 [4]".	-	-	-	-
3	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session.  Note: PDU SESSION ESTABLISHMENT REQUEST is included in UL NAS transport. UL NAS transport message is included in dedicatedNAS-Message of <i>ULInformationTransfer</i> message. DNN information is included in UL NAS transport message.	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	-	-
4	The SS transmits PDU SESSION AUTHENTICATION COMMAND including an EAP-Request message.	<--	PDU SESSION AUTHENTICATION COMMAND		
5	Check: Does the UE transmit a PDU SESSION AUTHENTICATION COMPLETE containing EAP-Response message?	-->	PDU SESSION AUTHENTICATION COMPLETE	1	P
6	The SS transmits PDU SESSION ESTABLISHMENT REJECT message with 5GSM cause #29 including an EAP-Failure message.	<--	PDU SESSION ESTABLISHMENT REJECT		
7	The generic procedure for SS-requested IPsec Secure tunnel disconnection, specified in subclause 4.5A.3 of TS 38.508-1 [4], takes place performing disconnection of security association.	-		-	-
8	Cause the UE to request connectivity to an additional PDU session. (see Note 1)	-	-	-	-
9	UE transmits establishes a IPSEC SA and NAS signalling connection as per generic procedure in table 4.5A.4.2.2-1 of 38.508-1 [4]".	-	-	-	-
10	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session.  Note: PDU SESSION ESTABLISHMENT REQUEST is included in UL NAS transport. UL NAS transport message is included in dedicatedNAS-Message of <i>ULInformationTransfer</i> message. DNN information is included in UL NAS transport message.	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	2	P
11	The SS transmits PDU SESSION AUTHENTICATION COMMAND including an EAP-Request message.	<--	PDU SESSION AUTHENTICATION COMMAND		
12	Check: Does the UE transmit a PDU SESSION AUTHENTICATION COMPLETE containing EAP-Response message?	-->	PDU SESSION AUTHENTICATION COMPLETE	-	-
13	The SS establishes an IPsec child security association according to the IKEv2 specification in RFC 7296 [32]	-	-	-	
14	The SS transmits PDU SESSION ESTABLISHMENT ACCEPT message containing an EAP-Success message.	<--	PDU SESSION ESTABLISHMENT ACCEPT		

15	SS Transmits PDU SESSION MODIFICATION COMMAND	<--	PDU SESSION MODIFICATION COMMAND	-	-
	Check: Does the UE transmit a PDU SESSION MODIFICATION COMPLETE?	-->	PDU SESSION MODIFICATION COMPLETE	3	P
-	EXCEPTION: Step 16a1 describes behaviour depending UE implementation; the "lower case letter" identifies a step sequence that take place if the UE performs a specific action.	-	-	-	-
16a1	If initiated by the UE, the generic procedure for IP address allocation in the user plane, specified in subclause 4.5.6, takes place performing IP address allocation in the user plane.	-	-	-	-
Note 1: The request of connectivity to an additional PDU session may be performed by MMI or AT command +CGACT.					

10.3.1.1.3.3 Specific message contents

Table 10.3.1.1.3.3-1: SERVICE REQUEST (step 2 and 9, Table 10.3.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-16			
Information Element	Value/remark	Comment	Condition
Service type	'0000'B	signalling	
PDU session status	PDU session IDs	PDU session IDs of the ACTIVE PDU session established during Preamble.	

Table 10.3.1.1.3.3-2: SERVICE ACCEPT (step 2 and 9, Table 10.3.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-17			
Information Element	Value/remark	Comment	Condition
PDU session status	PDU session IDs	PDU session IDs of the ACTIVE PDU session established during Preamble.	

Table 10.3.1.1.3.3-3: PDU SESSION ESTABLISHMENT REQUEST (step 3 and 10, Table 10.3.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.2-1			
Information Element	Value/remark	Comment	Condition
PDU session ID	PSI-1	UE assigns a particular PSI not yet used between 1 and 15	
PTI	PTI-1	UE assigns a particular PTI not yet used between 1 and 254	



Table 10.3.1.1.3.3-4: UL NAS Transport (step 3 and 10, Table 10.3.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-10			
Information Element	Value/remark	Comment	Condition
Payload container type	‘0001’B	N1 SM information	
PDU session ID	PSI-1		
Request type	‘001’B	Initial request	
S-NSSAI	Not Present		
DNN	DNN-1 (New DNN name)	The requested DNN is different from default DNN.	

Table 10.3.1.1.3.3-5: PDU SESSION ESTABLISHMENT REJECT (step 6, Table 10.3.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.2-3			
Information Element	Value/remark	Comment	Condition
PDU session ID	PSI-1		
PTI	PTI-1		
5GSM cause	‘00011 101’	User authentication or authorization failed	

Table 10.3.1.1.3.3-6: PDU SESSION ESTABLISHMENT ACCEPT (step 14, Table 10.3.1.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.2-2			
Information Element	Value/remark	Comment	Condition
PDU session ID	PSI-1		
PTI	PTI-1		
Authorized QoS rules			
QoS rule			
QoS rule identifier	‘0000 0001’B		
Rule operation code	‘001’B	Create new QoS rule	
DQR bit	‘1’B	The QoS rule is the default QoS rule.	
Number of packet filters	‘0001’B	1 packet filter	
Packet filter list	See table 4.8.2.1-1	Packet filter list #1	
Packet filter direction	‘11’B	bidirectional	
Packet filter identifier	‘0000’B	Id 0	
Component type 1 ID	‘0000 0001’B	Match-all type	
QoS rule precedence	‘0000 0000’B	0	
QoS flow identifier (QFI)	‘00 0011’B	QFI 3	
EAP message			
QoS flow description			
QFI	‘00 0011’B	QFI 3	
Operation code	‘001’B	Create new QoS flow description	
E bit	‘1’B	Parameters list is included	
Number of parameters	‘00 0001’B	1 parameters	
5QI	‘0000 1001’B	5QI 9	
DNN	DNN-1		

## 10.3.2 Network-requested PDU session modification

### 10.3.2.1 Network-requested PDU session modification /Accepted/Rejected

#### 10.3.2.1.1 Test Purpose (TP)

(1)

```
with { the UE in PDU SESSION ACTIVE state and 5GMM-CONNECTED mode }

ensure that {

    when { the UE receives a PDU SESSION MODIFICATION COMMAND message include the PDU session ID which
does not belong to any PDU session in PDU SESSION ACTIVE state in UE }

    then { UE sends a PDU SESSION MODIFICATION COMMAND REJECT message and set the 5GSM cause to #43:
invalid PDU session identity }

}
```

(2)

```
with { the UE in PDU SESSION ACTIVE state and 5GMM-CONNECTED mode }

ensure that {

    when { the UE receives a PDU SESSION MODIFICATION COMMAND message include the PDU session ID which
belongs to a PDU session in PDU SESSION ACTIVE state in UE }

    then { UE sends a PDU SESSION MODIFICATION COMMAND REJECT message and set the 5GSM cause to #43:
invalid PDU session identity }

}
```

#### 10.3.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 6.3.2.2, 6.3.2.4. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.3.2.2]

In order to initiate the network-requested PDU session modification procedure, the SMF shall create a PDU SESSION MODIFICATION COMMAND message.

If the authorized QoS rules of the PDU session is modified, the SMF shall set the authorized QoS rules IE of the PDU SESSION MODIFICATION COMMAND message to the authorized QoS rules of the PDU session. The SMF shall ensure that the number of the packet filters used in the authorized QoS rules of the PDU Session does not exceed the maximum number of packet filters supported by the UE for the PDU session. The SMF may bind service data flows for which the UE has requested traffic segregation to a dedicated QoS flow for the PDU session, if possible. Otherwise the SMF may bind the service data flows to an existing QoS flow. The SMF shall use only one dedicated QoS flow for traffic segregation. If the UE has requested traffic segregation for multiple service data flows with different QoS handling, the SMF shall bind all these service data flows to a single QoS flow. If the SMF allows traffic segregation for service data flows in a QoS rule, then the SMF shall create a new authorized QoS rule for these service data flows and shall delete packet filters corresponding to these service data flows from the other authorized QoS rules.

If the authorized QoS flow descriptions of the PDU session is modified, the SMF shall set the authorized QoS flow descriptions IE of the PDU SESSION MODIFICATION COMMAND message to the authorized QoS flow descriptions of the PDU session.

If SMF creates a new authorized QoS rule for a new QoS flow, then SMF shall include the authorized QoS flow description for that QoS flow in the authorized QoS flow descriptions IE of the PDU SESSION MODIFICATION COMMAND message, if:

- a) the newly created authorized QoS rules is for a new GBR QoS flow;
- b) the QFI of the new QoS flow is not the same as the 5QI of the QoS flow identified by the QFI; or
- c) the new QoS flow can be mapped to an EPS bearer as specified in subclause 4.11.2 of 3GPP TS 23.502 [9].

If the session-AMBR of the PDU session is modified, the SMF shall set the selected Session-AMBR IE of the PDU SESSION MODIFICATION COMMAND message to the session-AMBR of the PDU session.

If interworking with EPS is supported for the PDU session and if the mapped EPS bearer contexts of the PDU session is modified, the SMF shall set the mapped EPS bearer contexts IE of the PDU SESSION MODIFICATION COMMAND message to the mapped EPS bearer contexts of the PDU session. If the association between a QoS flow and the mapped EPS bearer context is changed, the SMF shall set the EPS bearer identity parameter in authorized QoS flow descriptions IE of the PDU SESSION MODIFICATION COMMAND message to the new EPS bearer identity associated with the QoS flow.

If the network-requested PDU session modification procedure is triggered by a UE-requested PDU session modification procedure and the PDU SESSION MODIFICATION REQUEST message includes a 5GSM capability IE, the SMF shall:

- a) if the RQoS bit is set to:
  - 1) "Reflective QoS supported", consider that the UE supports reflective QoS for this PDU session; or
  - 2) "Reflective QoS not supported", consider that the UE does not support reflective QoS for this PDU session; and;
- b) if the MH6-PDU bit is set to:
  - 1) "Multi-homed IPv6 PDU session supported", consider that this PDU session is supported to use multiple IPv6 prefixes; or
  - 2) "Multi-homed IPv6 PDU session not supported", consider that this PDU session is not supported to use multiple IPv6 prefixes.

If the SMF considers that reflective QoS is supported for QoS flows belonging to this PDU session, the SMF may include the RQ timer IE set to an RQ timer value in the PDU SESSION MODIFICATION COMMAND message.

If the network-requested PDU session modification procedure is triggered by a UE-requested PDU session modification procedure, the PDU session type is "IPv4", "IPv6", "IPv4v6" or "Ethernet" and the PDU SESSION MODIFICATION REQUEST message includes a Maximum number of supported packet filters IE, the SMF shall consider this number as the maximum number of packet filters that can be supported by the UE for this PDU session. Otherwise the SMF considers that the UE supports 16 packet filters for this PDU session.

For a PDN connection established when in S1 mode, upon the first inter-system change from S1 mode to N1 mode, if the network-requested PDU session modification procedure is triggered by a UE-requested PDU session modification procedure, the SMF shall consider that the maximum data rate per UE for user-plane integrity protection supported by the UE for uplink and the maximum data rate per UE for user-plane integrity protection supported by the UE for downlink are valid for the lifetime of the PDU session.

For a PDN connection established when in S1 mode, upon the first inter-system change from S1 mode to N1 mode, if the network-requested PDU session modification procedure is triggered by a UE-requested PDU session modification procedure and the SMF determines, based on local policies or configurations in the SMF and the Always-on PDU session requested IE in the PDU SESSION MODIFICATION REQUEST message (if available), that either:

- a) the requested PDU session needs to be an always-on PDU session, the SMF shall include the Always-on PDU session indication IE in the PDU SESSION MODIFICATION COMMAND message and shall set the value to "Always-on PDU session required"; or
- b) the requested PDU session shall not be an always-on PDU session and:
  - i) if the UE included the Always-on PDU session requested IE, the SMF shall include the Always-on PDU session indication IE in the PDU SESSION MODIFICATION COMMAND message and shall set the value to "Always-on PDU session not allowed"; or
  - ii) if the UE did not include the Always-on PDU session requested IE, the SMF shall not include the Always-on PDU session indication IE in the PDU SESSION MODIFICATION COMMAND message.

If the value of the RQ timer is set to "deactivated" or has a value of zero, the UE considers that RQoS is not applied for this PDU session and remove the derived QoS rule(s) associated with the PDU session, if any.

If the network-requested PDU session modification procedure is triggered by a UE-requested PDU session modification procedure, the SMF shall set the PTI IE of the PDU SESSION MODIFICATION COMMAND message to the PTI of the PDU SESSION MODIFICATION REQUEST message received as part of the UE-requested PDU session modification procedure.

If the network-requested PDU session modification procedure is not triggered by a UE-requested PDU session modification procedure, the SMF shall set the PTI IE of the PDU SESSION MODIFICATION COMMAND message to "No procedure transaction identity assigned".

If the selected SSC mode of the PDU session is "SSC mode 3" and the SMF requests the relocation of SSC mode 3 PDU session anchor with multiple PDU sessions as specified in 3GPP TS 23.502 [9], the SMF shall include 5GSM cause #39 "reactivation requested" , in the PDU SESSION MODIFICATION COMMAND message, and may include the PDU session address lifetime in a PDU session address lifetime PCO parameter in the Extended protocol configuration options IE of the PDU SESSION MODIFICATION COMMAND message.

The SMF shall send the PDU SESSION MODIFICATION COMMAND message, and the SMF shall start timer T3591 (see example in figure 6.3.2.2.1).

NOTE: If the SMF requests the relocation of SSC mode 3 PDU session anchor with multiple PDU sessions as specified in 3GPP TS 23.502 [9], the reallocation requested indication indicating whether the SMF is to be reallocated or the SMF is to be reused is provided to the AMF.

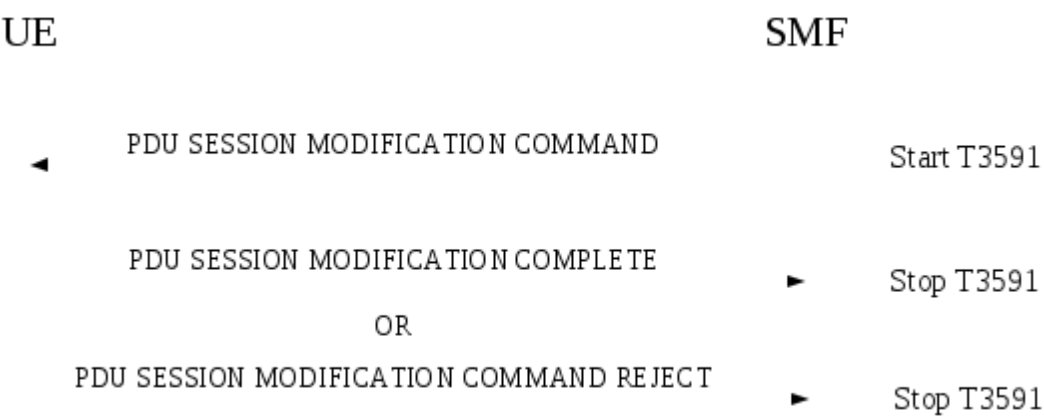


Figure 6.3.2.2.1: Network-requested PDU session modification procedure

[TS 24.501, clause 6.3.2.4]

Upon receipt of a PDU SESSION MODIFICATION COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, if the UE rejects the PDU SESSION MODIFICATION COMMAND message, the UE shall create a PDU SESSION MODIFICATION COMMAND REJECT message.

If the PDU SESSION MODIFICATION COMMAND message contains the PTI value allocated in the UE-requested PDU session modification procedure, the UE shall release the PTI indicated by the PTI IE and shall stop the timer T3581.

The UE shall set the 5GSM cause IE of the PDU SESSION MODIFICATION COMMAND REJECT message to indicate the reason for rejecting the PDU session modification.

The 5GSM cause IE typically indicates one of the following 5GSM cause values:

- #26 insufficient resources;
- #43 invalid PDU session identity;
- #44 semantic error in packet filter(s);
- #45 syntactical error in packet filter(s);
- #83 semantic error in the QoS operation; or
- #84 syntactical error in the QoS operation.

10.3.2.1.3 Test description

10.3.2.1.3.1 Pre-test conditions

System Simulator:

WLAN Cell 27

UE:

None.

Preamble:

The UE is in state 3W-A on WLAN Cell 27 with PDU session Active state according to TS 38.508-1 [4].

10.3.2.1.3.2 Test procedure sequence

Table 10.3.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The SS transmits a PDU session modification command message with PDU session ID IE is set to a different value from the value set in PDU SESSION ESTABLISHMENT REQUEST message. This message is included in a DLInformationTransfer message.	<--	PDU SESSION MODIFICATION COMMAND	-	-
2	Check: Does the UE transmit a PDU session modification reject with the 5GSM cause IE indicating #43 "invalid PDU session identity"?	-->	PDU SESSION MODIFICATION REJECT	1	P
3	The SS transmits a PDU session modification command message with PDU session ID IE is the value set in PDU SESSION ESTABLISHMENT REQUEST message. This message is included in a DLInformationTransfer message.	<--	PDU SESSION MODIFICATION COMMAND	-	-
4	Check: Does the UE transmit a PDU session modification complete?	-->	PDU SESSION MODIFICATION COMPLETE	2	P

10.3.2.1.3.3 Specific message contents

Table 10.3.2.1.3.3-1: PDU SESSION MODIFICATION COMMAND (Step 1, Table 10.3.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-9			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The different value from the value set in PDU SESSION ESTABLISHMENT REQUEST message in preamble		

Table 10.3.2.1.3.3-2: PDU SESSION MODIFICATION REJECT (Step 2, Table 10.3.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-8			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The same value as the value set in PDU SESSION modification command message		
5GSM cause	'00101011'B	Invalid PDU session identity	

Table 10.3.2.1.3.3-1: PDU SESSION MODIFICATION COMMAND (Step 3, Table 10.3.2.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-9			
Information Element	Value/Remark	Comment	Condition
PDU session ID	The value set in PDU SESSION ESTABLISHMENT REQUEST message in preamble		
Authorized QoS rules	Reference QoS rule #3 as defined in 38.508-1 [4]Table 4.8.2.1-1.		

### 10.3.3 Network-requested PDU session Release

#### 10.3.3.1 Network-requested PDU session release / accepted/ with and without reactivation

##### 10.3.3.1.1 Test Purpose (TP)

(1)

```
with { the UE in PDU SESSION ACTIVE state }

ensure that {

    when { the UE receives a PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested"}

    then { the UE re-initiates a PDU SESSION establishment procedure for the same [S-NSSAI, DNN] combination provided in PDU session establishment procedure }

}
```

(2)

```
with { UE is in PDU SESSION ACTIVE state }

ensure that {

    when { UE receives a PDU SESSION RELEASE COMMAND message including 5GSM cause #26 "insufficient resources" and the Back-off timer value that indicates deactivated }

    then { UE does not send a PDU SESSION ESTABLISHMENT REQUEST message until the UE is switched off or the USIM is removed }

}
```

##### 10.3.3.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 6.3.3.2, 6.3.3.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 6.3.3.2]

In order to initiate the network-requested PDU session release procedure, the SMF shall create a PDU SESSION RELEASE COMMAND message.

The SMF shall set the SM cause IE of the PDU SESSION RELEASE COMMAND message to indicate the reason for releasing the PDU session.

The SM cause IE typically indicates one of the following SM cause values:

- #26 insufficient resources;
- ...

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #26 "insufficient resources" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #26 "insufficient resources" and the PDU SESSION RELEASE COMMAND message is sent

to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #67 "insufficient resources for specific slice and DNN" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #67 "insufficient resources for specific slice and DNN" and the PDU SESSION RELEASE COMMAND message is sent to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

[TS 24.501, clause 6.3.3.3]

Upon receipt of a PDU SESSION RELEASE COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE considers the PDU session as released and the UE shall create a PDU SESSION RELEASE COMPLETE message.

If the PDU SESSION RELEASE COMMAND message contains the PTI value allocated in the UE-requested PDU session release procedure, the UE shall stop the timer T3582. The UE should ensure that the PTI value assigned to this procedure is not released immediately.

NOTE 1: The way to achieve this is implementation dependent. For example, the UE can ensure that the PTI value assigned to this procedure is not released during the time equal to or greater than the default value of timer T3592.

While the PTI value is not released, the UE regards any received PDU SESSION RELEASE COMMAND message with the same PTI value as a network retransmission (see subclause 7.3.1).

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested", then after completion of the network-requested PDU session release procedure, the UE should re-initiate the UE-requested PDU session establishment procedure as specified in subclause 6.4.1 for:

- a) the PDU session type associated with the released PDU session;
- b) the SSC mode associated with the released PDU session;
- c) the DNN associated with the released PDU session; and
- d) the S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI if provided in the UE-requested PDU session establishment procedure of the released PDU session.

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested" and the UE provided an S-NSSAI during the PDU session establishment, the UE shall stop timer T3585 if it is running for the S-NSSAI provided by the UE. The UE should then re-initiate the UE requested PDU session establishment procedure for the same S-NSSAI. If the UE did not provide an S-NSSAI during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop the timer T3585 associated with no S-NSSAI if it is running, and should re-initiate the UE requested PDU session establishment procedure without including an S-NSSAI. If the PDU SESSION RELEASE COMMAND message was received for an emergency PDU session, the UE shall not stop the timer T3585 associated with no S-NSSAI if it is running.

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested" and the UE provided a DNN during the PDU session establishment, the UE shall stop timer T3396 if it is running for the DNN provided by the UE. The UE should then re-initiate the UE requested PDU session establishment procedure for the same DNN. If the UE did not provide a DNN during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop the timer T3396 associated with no DNN if it is running, and should re-initiate the UE requested PDU session establishment



procedure without including a DNN. If the PDU SESSION RELEASE COMMAND message was received for an emergency PDU session, the UE shall not stop the timer T3396 associated with no DNN if it is running.

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested" and the UE provided an S-NSSAI and a DNN during the PDU session establishment, the UE shall stop timer T3584 if it is running for the same [S-NSSAI, DNN] combination provided by the UE. The UE should then re-initiate the UE requested PDU session establishment procedure for the same [S-NSSAI, DNN] combination. If the UE did not provide an S-NSSAI during the PDU session establishment, the UE shall stop the timer T3584 associated with [no S-NSSAI, DNN] if it is running, and should re-initiate the UE requested PDU session establishment procedure with the same DNN but without an S-NSSAI. If the UE did not provide a DNN during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop the timer T3584 associated with [S-NSSAI, no DNN] if it is running, and should re-initiate the UE requested PDU session establishment procedure with the same S-NSSAI but without a DNN. If the PDU SESSION RELEASE COMMAND message was received for an emergency PDU session, the UE shall not stop the timer T3584 associated with [S-NSSAI, no DNN] if it is running. If the UE provided neither a DNN nor an S-NSSAI during the PDU session establishment and the request type was different from "initial emergency request" and different from "existing emergency PDU session", the UE shall stop the timer T3584 associated with [no S-NSSAI, no DNN] if it is running, and should re-initiate the UE requested PDU session establishment procedure without an S-NSSAI and a DNN. If the PDU SESSION RELEASE COMMAND message was received for an emergency PDU session, the UE shall not stop the timer T3584 associated with [no S-NSSAI, no DNN] if it is running.

NOTE 2: User interaction is necessary in some cases when the UE cannot re-initiate the UE-requested PDU session establishment procedure automatically.

NOTE 3: If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested" for a PDU session, the UE provided a DNN (or no DNN) and an S-NSSAI (or no S-NSSAI) when the PDU session is established, timer T3396 associated with the DNN (or no DNN, if no DNN was provided by the UE) is running, and timer T3584 associated with the DNN (or no DNN, if no DNN was provided by the UE) and the S-NSSAI (or no S-NSSAI, if no S-NSSAI was provided by the UE) is running, then the UE stops both the timer T3396 and the timer T3584.

NOTE 4: If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #39 "reactivation requested" for a PDU session, the UE provided a DNN (or no DNN) and an S-NSSAI (or no S-NSSAI) when the PDU session is established, timer T3585 associated with the S-NSSAI (or no S-NSSAI, if no S-NSSAI was provided by the UE) is running, and timer T3584 associated with the DNN (or no DNN, if no DNN was provided by the UE) and the S-NSSAI (or no S-NSSAI, if no S-NSSAI was provided by the UE) is running, then the UE stops both the timer T3585 and the timer T3584.

10.3.3.1.3

Test description

10.3.3.1.3.1

Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state 3W-A on WLAN Cell 27 according to TS 38.508-1 [4].

10.3.3.1.3.2 Test procedure sequence

Table 10.3.3.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS transmits a PDU SESSION RELEASE COMMAND including 5GSM cause #39 "reactivation requested " with PDU session ID IE is set to the same value in PDU SESSION ESTABLISHMENT REQUEST message in preamble.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION RELEASE COMMAND	-	-
2	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST and the S-NSSAI and DNN in UL NAS TRANSPORT message are the same values in UL NAS TRANSPORT message in preamble?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
3	The SS transmits an PDU SESSION ESTABLISHMENT ACCEPT	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT		
4	The SS transmits a PDU SESSION RELEASE COMMAND including 5GSM cause #26 "insufficient resources" and T3396 value (deactivated).	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION RELEASE COMMAND	-	-
5	The UE transmits a PDU SESSION RELEASE COMPLETE message.	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION RELEASE COMPLETE	-	-
6	Cause the UE to request establishment of PDU session without DNN.(Note 1)	-	-	-	-
7	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	2	F
8	Switch off procedure in Ipsec_SA_Established specified in TS 38.508-1 [4] subclause 4.9.6.5 is performed.	-			
9	Switch on UE.	-			
10	The general procedure is completed by executing of the UE registration procedure in TS 38.508-1 [4] table 4.5.2.2-3 , 'connected without release'.	-			
11	Cause the UE to request establishment of PDU session without DNN.(Note 1)	-	-	-	-
12	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST message?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	3	P
13	The SS transmits a PDU SESSION ESTABLISHMENT ACCEPT message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
Note 1: The request to establish a PDU session may be performed by MMI or AT command.					

10.3.3.1.3.3 Specific message contents

Table 10.3.3.1.3.3-1: PDU SESSION RELEASE COMMAND (Step 1, Table 10.3.3.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.2-14			
Information Element	Value/Remark	Comment	Condition

PDU session ID	The same value indicated in PDU SESSION ESTABLISHMENT REQUEST message in preamble		
5GSM cause	'00100111'B	Reactivation requested	

Table 10.3.3.1.3.3-2: UL NAS TRANSPORT (Step 2, Table 10.3.3.1.3.2-1)

Derivation path: TS 38.508-1 [4], table 4.7.1-10			
Information Element	Value/Remark	Comment	Condition
S-NSSAI	The same value indicated in UL NAS TRANSPORT message in preamble		If present in UL NAS TRANSPORT message in preamble
	Not present		If not present in UL NAS TRANSPORT message in preamble
DNN	The same value indicated in UL NAS TRANSPORT message in preamble		If present in UL NAS TRANSPORT message in preamble
	Not present		If not present in UL NAS TRANSPORT message in preamble

Table 10.3.3.1.3.3-3: PDU SESSION RELEASE COMMAND (step 4, Table 10.3.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition

PDU session ID	The same ID as the ID of PDU session which UE request in step 13 in Table 10.1.3.2.3.2-1		
5GSM cause	'0001 1010'B	insufficient resources	
Back-off timer value	'1110 0000'B	deactivated	

10.3.4 UE-requested PDU session establishment

10.3.4.1 UE-requested PDU session establishment / Abnormal / T3580

10.3.4.1.1 Test Purpose (TP)

Same test purpose as in clause 10.1.4.2.1

10.3.4.1.2 Conformance requirements

Same conformance requirements as in clause 10.1.4.2.2

10.3.4.1.3 Test description

10.3.4.1.3.1 Pre-test conditions

System Simulator:

- WLAN Cell 27

UE:

- None.

Preamble:

- The UE is in state Switched OFF [State 0-A as per TS 38.508-1 [4] Table 4.4A.2-0].

10.3.4.1.3.2 Test procedure sequence

Table 10.3.4.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	UE is switched on	-	-	-	-
2-10	Steps 1-9 of Table 4.5.2.2-3 of the generic procedure in TS 38.508-1 [4] are performed.	-	-	-	-
11	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session.	-->	PDU SESSION ESTABLISHMENT REQUEST	-	-
-	EXCEPTION: Steps 12-13 shall be repeated for 4 times	-	-	-	-
12	The SS waits 16 seconds (T3580).	-	-	-	-
13	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session. (Attempt counter = 5)	-->	PDU SESSION ESTABLISHMENT REQUEST	1	P
15	The UE transmits a PDU SESSION ESTABLISHMENT REQUEST message to request an additional PDU session.	-->	PDU SESSION ESTABLISHMENT REQUEST	2	F

10.3.4.1.3.3                      Specific message contents

None.

10.3.5        UE-requested PDU session modification

10.3.5.1        UE-requested PDU session modification/Success

10.3.5.1.1                      Test Purpose (TP)

(1)

with { UE in PDU SESSION ACTIVE state and in 5GMM-CONNECTED mode }  
  
ensure that {  
  
    when { UE is requested to modify of PDU session }  
  
        then { UE sends a PDU SESSION MODIFICATION REQUEST message }  
  
    }

10.3.5.1.2                      Conformance requirements

Same conformance requirements as in clause 10.1.5.1.2

10.3.5.1.3                      Test description

10.3.5.1.3.1                    Pre-test conditions

System Simulator:

- WLAN Cell 27.

UE:

- None.

Preamble:

- The UE is in state 3W-A onWLAN Cell 27 with PDU SESSION ACTIVE according to TS 38.508-1[4].

10.3.5.1.3.2            Test procedure sequence

Same test procedure sequence as in clause 10.1.5.1.3.2

10.3.5.1.3.3            Specific message contents

Same specific message contents as in clause 10.1.5.1.3.3

10.3.6      UE-requested PDU session release

10.3.6.1      UE-requested PDU session release / Abnormal / Collision with network-requested PDU session modification procedure

10.3.6.1.1            Test Purpose (TP)

(1)

```
with { the UE is in PDU SESSION ACTIVE state and has sent a PDU SESSION RELEASE REQUEST message }
ensure that {

    when { UE receives a PDU SESSION MODIFICATION COMMAND message indicating a PDU session that UE
wants to release }

    then { the UE ignores the PDU SESSION MODIFICATION COMMAND message and proceed with the PDU
session release procedure }

}
```

10.3.6.1.2            Conformance requirements

Same conformance requirements as in clause 10.1.6.1.2

10.3.6.1.3            Test description

10.3.6.1.3.1           Pre-test conditions

System Simulator:

- WLAN Cell 27.

UE:

None.

Preamble:

- The UE is in state 3W-A on WLAN Cell 27 according to TS 38.508-1 [4].

10.3.6.1.3.2

Test procedure sequence

Table 10.3.6.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to request establishment of PDU session to the DN.(Note 1)	-	-	-	-
2	New PDU session establishment procedure is performed as per generic procedure in clause 4.5A.2A of TS 38.508-1 [4]	-	-	-	-
3	Cause the UE to request release of PDU session established during preamble.(Note 2)	-	-	-	-
4	The UE transmits a PDU SESSION RELEASE REQUEST message.	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION RELEASE REQUEST	-	-
5	The SS transmits a PDU SESSION MODIFICATION COMMAND message.	<--	5GMM: DL NAS TRANSPROT 5GSM: PDU SESSION MODIFICATION COMMAND	-	-
6	The SS transmits a PDU SESSION RELEASE COMMAND message.	<--	5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION RELEASE COMMAND	-	-
7	Check: Does the UE transmit PDU SESSION RELEASE COMPLETE message?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION RELEASE COMPLETE	1	P
8	The SS deletes the payload associated with IPSec child security association according to the IKEv2 specification in RFC 7296 [32]	-	-	-	-
Note 1: The request to establish a PDU session may be performed by MMI or AT command.					
Note 2: The request to release a PDU session may be performed by MMI or AT command.					

10.3.6.1.3.3

Specific message contents

Table 10.3.6.1.3.3-1: PDU SESSION RELEASE REQUEST (step 4, Table 10.3.6.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-12			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.3.6.1.3.2-1		
PTI	Any value from 1 to 254		

Table 10.3.6.1.3.3-2: PDU SESSION MODIFICATION COMMAND (step 5, Table 10.3.6.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-9			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.3.6.1.3.2-1		
PTI	'0000 0000'B	No procedure transaction identity assigned	

Table 10.3.6.1.3.3-3: PDU SESSION RELEASE COMMAND (step 6, Table 10.3.6.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition

PDU session ID	Set to the ID UE requested in step 2 in Table 10.3.6.1.3.2-1		
PTI	The value indicated in PDU SESSION RELEASE REQUEST		
5GSM cause	'0010 0100'B	#36 regular deactivation	

Table 10.3.6.1.3.3-4: PDU SESSION RELEASE COMPLETE (step 7, Table 10.3.6.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-15			
Information Element	Value/remark	Comment	Condition
PDU session ID	Set to the ID UE requested in step 2 in Table 10.3.6.1.3.2-1		
PTI	The value indicated in PDU SESSION RELEASE REQUEST		

# 11 Multilayer Procedures

## 11.1 5GS\EPS Fallback

### 11.1.1 MO MMTEL voice call setup from NR RRC\_IDLE / EPS Fallback with redirection / Single registration mode with N26 interface / Success

#### 11.1.1.1 Test Purpose (TP)

(1)

**with** { UE supporting both S1 mode and N1 mode and operating in single-registration mode and the Network having indicated "interworking without N26 interface not supported" and the UE in NR RRC\_IDLE state }

**ensure that** {

**when** { User initiates an MMTEL call and the UE completes Access control and checking in 5GMM-IDLE mode }

**then** { UE requests the establishment of an MMTEL call by transmitting an RRCSetupRequest message with establishmentCause set to 'mo-VoiceCall' and a SERVICE REQUEST message with Service type set to 'data' }

}

(2)

**with** { UE being in NR RRC\_CONNECTED state after having requested an MMTEL call establishment and the MO IMS voice session establishment has been initiated }

**ensure that** {



```
    when { UE receives an RRCRelease message which includes redirectedCarrierInfo indicating
redirection to E-UTRA }

    then {UE selects the E-UTRA cell, performs a TAU procedure, and, successfully completes the
MMTEL call setup in EPS }

}
```

### 11.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501, clauses 4.5.4.1, 5.6.1.2 and TS 38.331: clauses 5.3.3.2, 5.3.3.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

[TS 24.501, clause 5.6.1.2]

For cases d) and e) in subclause 5.6.1.1, the Uplink data status IE shall be included in the SERVICE REQUEST message to indicate the PDU session(s) the UE has pending user data to be sent. If the UE is not a UE configured for high priority access in selected PLMN:

- a) if there exists an emergency PDU session which is indicated in the Uplink data status IE the service type IE in the SERVICE REQUEST message shall be set to "emergency services"; or
- b) otherwise, the service type IE in the SERVICE REQUEST message shall be set to "data".

[TS 38.331, clause 5.3.3.2]

The UE initiates the procedure when upper layers request establishment of an RRC connection while the UE is in RRC\_IDLE and it has acquired essential system information as described in 5.2.2.1.

The UE shall ensure having valid and up to date essential system information as specified in clause 5.2.2.2 before initiating this procedure.

Upon initiation of the procedure, the UE shall:

- 1> if the upper layers provide an Access Category and one or more Access Identities upon requesting establishment of an RRC connection:
- 2> perform the unified access control procedure as specified in 5.3.14 using the Access Category and Access Identities provided by upper layers;

[TS 38.331, clause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

- 1> set the *ue-Identity* as follows:
- 2> if upper layers provide a 5G-S-TMSI:

3> set the *ue-Identity* to *ng-5G-S-TMSI-Part1*;
- 2> else:

3> draw a 39-bit random value in the range  $0..2^{39}-1$  and set the *ue-Identity* to this value;

NOTE 1: Upper layers provide the *5G-S-TMSI* if the UE is registered in the TA of the current cell.

- 1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

11.1.1.3

Test Description

11.1.1.3.1

Pre-test conditions

System Simulator:

- NR Cell 1 is configured according to TS 38.508-1 [4] Table 4.4.2-3 and is connected to 5GC.
- E-UTRA Cell 1 is configured to TS 36.508 [7] Table 4.4.2-2 and is connected to EPC.
- System information for the NR Cell 1 in accordance with combination NR-6 in TS 38.508-1 [4] sub-clause 4.4.3.1.2, and, for the E-UTRA Cell 1 in accordance with system information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.
- N26 interface is configured.
- Power levels are constant and as defined in Table 11.1.1.3.1-1

Table 11.1.1.3.1-1: Cell power levels

	Parameter name	Unit	NR Cell 1	E-UTRA Cell 1
T0	SS/PBCH SSS EPRE	dBm/SCS	"Serving Cell"	
	RS EPRE	dBm/15kHz		"Serving Cell"

UE:

None.

Preamble:

With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established

The UE is switched-off

With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

11.1.1.3.2

Test procedure sequence

Table 11.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

0	Set the power levels according to “T0” as per Table 11.1.1.3.1-1.	-	-	-	-
1	Make the UE attempt an MTSI MO Speech Call (Note 1).	-	-	-	-
2	Check: Does the UE send NR <i>RRCSetupRequest</i> with <i>EstablishmentCause</i> set to ‘ <i>mo-VoiceCall</i> ’?	-->	NR RRC: <i>RRCSetupRequest</i>	1	P
3	SS transmits an NR <i>RRCSetup</i> message	<--	NR RRC: <i>RRCSetup</i>	-	-
4	Check: Does the UE transmit an NR <i>RRCSetupComplete</i> message to confirm the successful completion of the connection establishment including initiation of 5GSM procedure by including the SERVICE REQUEST message with <i>Service Type</i> set to ‘ <i>data</i> ’?	-->	NR RRC: <i>RRCSetupComplete</i> 5GSM: SERVICE REQUEST	1	P
5-8	Steps 5-8 of expected sequence from Table 4.5.4.2-3 as defined in TS 38.508-1 [4] are performed.	-	-	-	-
9-13	Steps 1-5 of expected sequence from A.9.1 as defined in TS 34.229-5 [41] are performed for initiating an MTSI MO speech call.	-	-	-	-
14	SS transmits <i>RRCRelease</i> message indicating redirection to E-UTRA Cell 1.	<--	NR RRC: <i>RRCRelease</i>	-	-
15-20	UE performs generic procedure as defined in TS 38.508-1 [4], Table 4.9.7.2.2-1 Steps 1-6 for N1 to S1 Inter mode change with condition ‘connected without release’ & ‘mapped 5G security context’.	-	-	-	-
21-24	Generic Test Procedure as defined in Steps 5-8 of TS 36.508-1 [4] Table 4.5A.6.3-1 is performed to establish radio bearer corresponding to IMS PDN.	-	-	-	-
-	EXCEPTION: Steps 25a1-25a2 describe a step sequence depending on UE implementation.	-	-	-	-
25a1-25a2	The UE may perform steps 1-2 according to TS 34.229-1 subclause C.46 to perform IMS re-registration on EUTRAN.	-	-	-	-
26	The SS configures a new RLC-UM data radio bearer with condition DRB (0,1), associated with the dedicated EPS bearer context. <i>RRCCConnectionReconfiguration</i> message contains the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message. EPS bearer context #4 (QCI 1) according to table 6.6.2-1: Reference dedicated EPS bearer contexts.	<--	RRC: <i>RRCCConnectionReconfiguration</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	-	-
-	EXCEPTION: In parallel to the events described in steps 27-28 the steps specified in table 11.1.1.3.2-2 will take place.	-	-	-	-
27	The UE transmits an <i>RRCCConnectionReconfigurationComplete</i> message to confirm the establishment of the new data radio bearer, associated with the dedicated EPS bearer.	-->	RRC: <i>RRCCConnectionReconfigurationComplete</i>	-	-
28	The UE transmits an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message.	-->	RRC: ULInformationTransfer NAS:ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	-	-
29	UE is triggered by MMI to release the call.	-	-	-	-

30-33	Follow the Test Steps 2-5 as defined in TS 34.229-1 [35] subclause C.32 for Generic test procedure for MO release of IMS call followed by EPS Bearer Deactivation.	-	-	-	-
34	SS transmits <i>RRConnectionRelease</i> message indicating redirection to NR Cell 1.	<--	RRC: <i>RRConnectionRelease</i>	-	-
35	Generic Test procedure for Tracking area updating / Inter-system change from S1 mode to N1 mode in 5GMM/EMM-IDLE mode with <i>connected without release</i> is present as mentioned in TS 38.508-1 [4] Table 4.9.9.2.2-1 is performed.	-	-	-	-
36-37	IF UE performed IMS re-registration over E-UTRAN in Steps 25a1-25a2, THEN the UE may perform IMS re-registration on NR Cell1 as per Annex A.12 of TS 34.229-5 [41]	-	-	-	-
38	Generic Procedure as defined in TS 38.508-1 [4] Table 4.9.6.3-1A to switch off the UE in NR RRC_CONNECTED mode with T3540 started is performed.	-	-	-	-
Note 1: UE is configured such that Access Control check passes for MO MMTEL Voice call.					

Table 11.1.1.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-4	Steps 1 to 4 of the Generic test procedure for setting up MTSI MO speech call - EPS fallback according TS 34.229-5 [41] subclause A.9.2 take place.	-	-	-	-
5	Step 5 of the Generic test procedure for setting up MTSI MO speech call - EPS fallback according TS 34.229-5 [41] subclause A.9.2 takes place.	-	-	2	P

11.1.1.3.3 Specific message contents

Table 11.1.1.3.3-1: RRCSetupRequest (step 2, table 11.1.1.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.6.1-23			
Information Element	Value/remark	Comment	Condition
RRCSetupRequest ::= SEQUENCE {			
rrcSetupRequest SEQUENCE {			
establishmentCause	mo-VoiceCall		
}			
}			

Table 11.1.1.3.3-2: SERVICE REQUEST (step 4, table 11.1.1.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-16			
Information Element	Value/Remark	Comment	Condition

Service type	'0001'B	data	
Uplink data status	Present	PSI bit corresponding to IMS PDN needs to be set	

Table 11.1.1.3.3-3: RRCRelease (step 14, table 11.1.1.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition
RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
redirectedCarrierInfo CHOICE {			
eutra SEQUENCE {			
eutraFrequency	Downlink EARFCN of EUTRA cell 1		
cnType	epc		
}			
}			
}			
}			
}			

Table 11.1.1.3.3-4: RRCConnectionRelease (step 34, table 11.1.1.3.2-1)

Derivation path: TS 36.508 [4] Table 4.6.1-15			
Information Element	Value/Remark	Comment	Condition
RRCConnectionRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
redirectedCarrierInfo SEQUENCE {			
nr-r15 ::= SEQUENCE {			
carrierFreq-r15	Downlink NR SSB ARFCN of cell NR Cell 1		TS 38.508-1 [4] cl.6.2.3.1
subcarrierSpacingSSB-r15			
}			
}			
}			
}			
}			

11.1.2 MO MMTEL voice call setup from NR RRC\_IDLE / EPS Fallback with redirection / Single registration mode without N26 interface / Success

11.1.2.1 Test Purpose (TP)

(1)

with {UE supporting both S1 mode and N1 mode and operating in single-registration mode, and, the Network has indicated "interworking without N26 interface supported", and, the UE is in NR RRC\_IDLE state}

```
ensure that {  
  
    when {User initiates a MMTEL call and the UE completes Access control and checking in 5GMM-IDLE mode}  
  
    then {UE requests the establishment of a MMTEL call by transmitting an RRCSetupRequest message with establishmentCause set to 'mo-VoiceCall', and, a SERVICE REQUEST message with Service type set to 'data'}  
  
}
```

(2)

```
with {the UE is NR RRC_CONNECTED state after having requested a MMTEL call establishment and the MO IMS voice session establishment has been initiated}  
  
ensure that {  
  
    when {the UE receives a RRCRelease message which includes redirectedCarrierInfo indicating redirection to eutra}  
  
    then {the UE selects the E-UTRA cell, performs an ATTACH or a TAU procedure, and, successfully completes the MO MMTEL call setup in EPS}  
  
}
```

11.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS23.502, clauses 4.11.2.2, 4.13.6.1; TS 24.501, clauses 4.5.4.1, 4.8.2.3; TS 38.331, clause 5.3.11. Unless otherwise stated these are Rel-15 requirements.

[TS 23.502, clause 4.11.2.2]

The following procedure is used by UEs in single-registration or dual registration mode on mobility from 5GS to EPS.

In the case of network sharing the UE selects the target PLMN ID according to clause 5.18.3 of TS 23.501 [2].

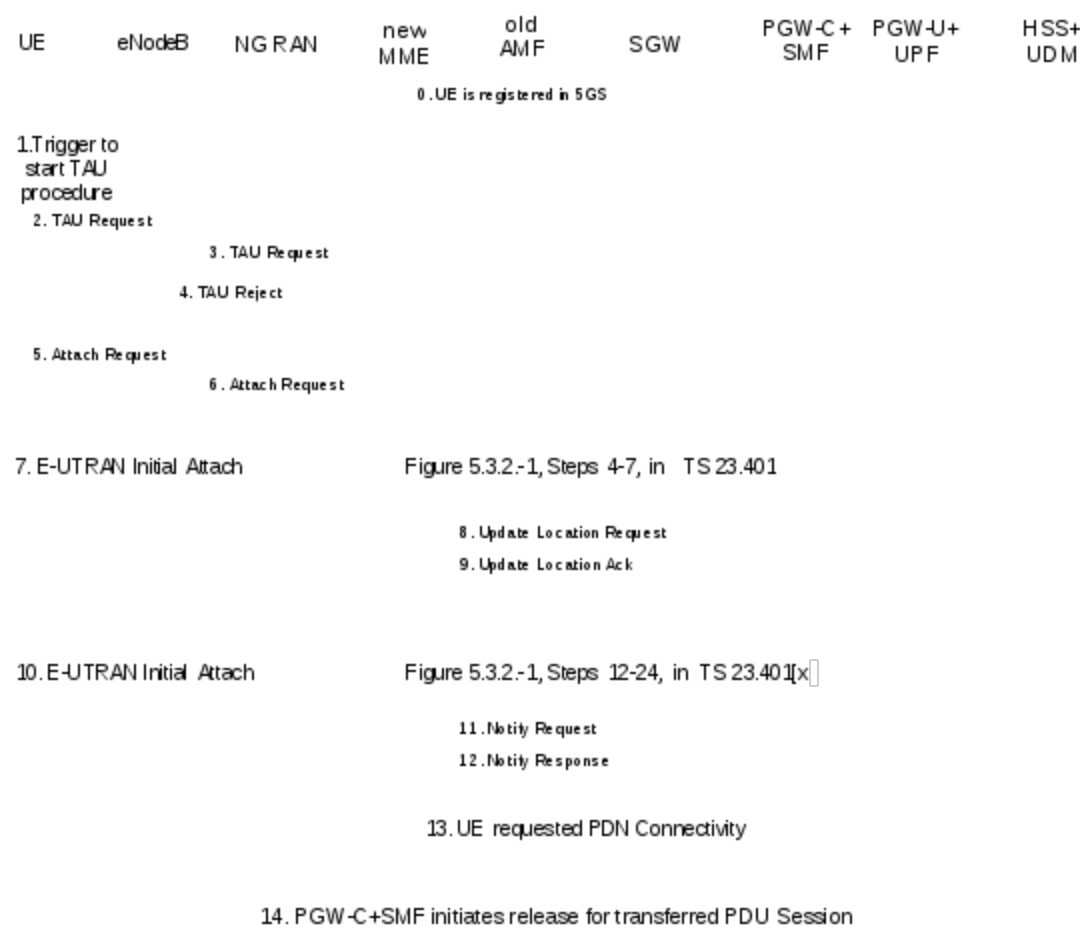


Figure 4.11.2.2-1: Mobility procedure from 5GS to EPS without N26 interface

The UE operating in single-registration mode can start the procedure from Step 1 or Step 5. The UE operating in dual-registration mode starts the procedure from Step 5.

NOTE 1: The network has indicated the "Interworking without N26" to the UE. To support IP address preservation, the UE in single-registration mode starts the procedure from Step 5. If the UE in single-registration mode starts the procedure from Step 1, the IP address preservation is not provided.

0. UE is registered in 5GS and established PDU sessions. The FQDN for the S5/S8 interface of the PGW-C+SMF is also stored in the UDM by the PGW-C+SMF during PDU Session setup in addition to what is specified in clause 4.3.2.2.1 and clause 4.3.2.2.2.

NOTE 2: At 5GS to EPS mobility, the MME use the FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF, and when UE moves back from EPS to 5GS, the AMF uses FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF.

- 1. Step 1 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].
- 2. Step 2 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13] with the following modifications:

The UE shall provide a EPS-GUTI that is mapped from the 5G-GUTI following the mapping rules specified in TS 23.501 [2]. The UE indicates that it is moving from 5GC.



3. Step 3 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].
4. If the MME determined that the old node is an AMF based on UE's GUTI mapped from 5G-GUTI and the MME is configured to support 5GS-EPS interworking without N26 procedure, the MME sends a TAU Reject to the UE.
5. Step 1 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13] with the modifications captured in clause 4.11.2.4.1.
6. Step 2 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].
7. Steps 4-7 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.
8. Step 8 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.
9. Step 11 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the following modifications:

The subscription profile the MME receives from HSS+UDM includes per DNN/APN at most one PGW-C+SMF FQDN as described in in clause 5.17.2.1 in TS 23.501 [2].
10. Steps 12-24 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications as described in clause 4.11.2.4.1.
11. Step 25 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].
12. Step 26 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].
13. If the UE has remaining PDU Sessions in 5GS which it wants to transfer to EPS and maintain the same IP address/prefix, the UE performs the UE requested PDN Connectivity Procedure as specified in TS 23.401 [13] clause 5.10.2 and sets the Request Type to "handover" in Step 1 of the procedure with modification captured in clause 4.11.2.4.2. UE provides an APN and the PDU Session ID corresponding to the PDU Session it wants to transfer to EPS. The UE provides the PDU Session ID in PCO as described in clause 4.11.1.1.

UEs in single-registration mode performs this step for each PDU Session immediately after completing the E-UTRAN Initial Attach procedure. UEs in dual-registration mode may perform this step any time after the completing of E-UTRAN Initial Attach procedure. Also, UEs in dual-registration mode may perform this step only for a subset of PDU Sessions.

The MME determines the PGW-C+SMF address for the Create Session Request based on the APN received from the UE and the subscription profile received from the HSS+UDM in Step 9 or when the HSS+UDM notifies the MME for the new PGW-C+SMF ID in the updated subscription profile.

The PGW-C+SMF uses the PDU Session ID to correlate the transferred PDN connection with the PDU Session in 5GC.

As a result of the procedure the PGW-U+UPF starts routing DL data packets to the Serving GW for the default and any dedicated EPS bearers established for this PDN connection.

14. The PGW-C+SMF initiates release of the PDU Session(s) in 5GS transferred to EPS as specified in clause 4.3.4.2 with the following clarification:

In step 2, the PGW-C+SMF shall not release IP address/prefix(es) allocated for the PDU Session.

If UP connection of the PDU Session is not active, step 3b is not executed, thus the steps triggered by step 3b are not executed;

If UP connection of the PDU Session is active, the SMF invokes the Namf\_Communication\_N1N2MessageTransfer service operation without including N1 SM container (PDU Session Release Command).

[TS 23.502, clause 4.13.6.1]

Figure 4.13.6.1-1 describes the EPS fallback procedure for IMS voice.

When the UE is served by the 5G System, the UE has one or more ongoing PDU Sessions each including one or more QoS Flows. The serving PLMN AMF has sent an indication towards the UE during the Registration procedure that IMS voice over PS session is supported, see clause 5.16.3.10 in TS 23.501 [2] and the UE has registered in the IMS. If N26 is not supported, the serving PLMN AMF sends an indication towards the UE during the Registration procedure that interworking without N26 is supported, see clause 5.17.2.3.1 in TS 23.501 [2].

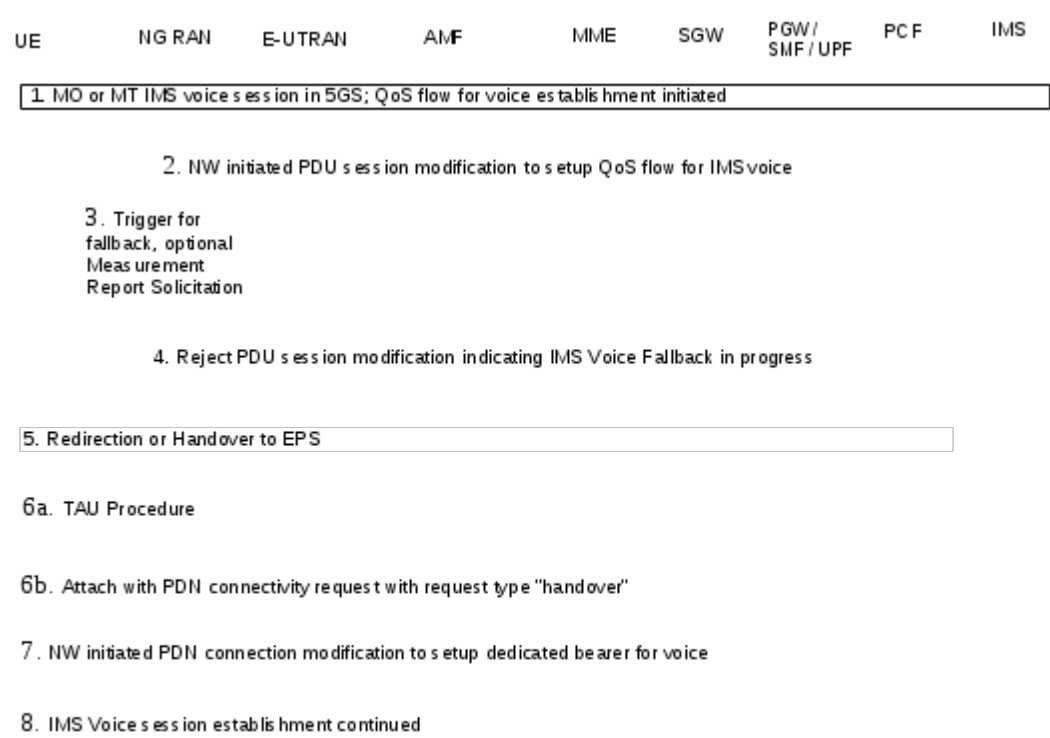


Figure 4.13.6.1-1: EPS Fallback for IMS voice

1. UE camps on NG-RAN in the 5GS and an MO or MT IMS voice session establishment has been initiated.
2. Network initiated PDU Session modification to setup QoS flow for voice reaches the NG-RAN (see N2 PDU Session Request in clause 4.3.3).
3. NG-RAN is configured to support EPS fallback for IMS voice and decides to trigger fallback to EPS, taking into account UE capabilities, indication from AMF that "Redirection for EPS fallback for voice is possible" (received as part of initial context setup as defined in TS 38.413 [10]), network configuration (e.g. N26 availability configuration) and radio conditions. If NG-RAN decides not to trigger fallback to EPS, then the procedure stops here and following steps are not executed.

NG-RAN may initiate measurement report solicitation from the UE including E-UTRAN as target.

NOTE 1: If AMF has indicated that "Redirection for EPS fallback for voice is not possible", then AN Release via inter-system redirection to EPS is not performed in step 5.

4. NG-RAN responds indicating rejection of the PDU Session modification to setup QoS flow for IMS voice received in step 2 by PDU Session Response message towards the PGW-C+SMF (or H-SMF+P-GW-C via V-SMF, in case of roaming scenario) via AMF with an indication that mobility due to fallback for IMS voice is ongoing. The PGW-C+SMF maintains the PCC rule(s) associated with the QoS Flow(s).
5. NG-RAN initiates either handover (see clause 4.11.1.2.1), or AN Release via inter-system redirection to EPS (see clause 4.2.6 and clause 4.11.1.3.2), taking into account UE capabilities. The PGW-C+SMF reports change of the RAT type if subscribed by PCF as specified in clause 4.11.1.2.1, or clause 4.11.1.3.2.6. When the UE is connected to EPS, either 6a or 6b is executed
  - 6a. In the case of 5GS to EPS handover, see clause 4.11.1.2.1, and in the case of inter-system redirection to EPS with N26 interface, see clause 4.11.1.3.2. In either case the UE initiates TAU procedure; or
  - 6b. In the case of inter-system redirection to EPS without N26 interface, see clause 4.11.2.2. If the UE supports Request Type flag "handover" for PDN connectivity request during the attach procedure as described in clause 5.3.2.1 of TS 23.401 [13] and has received the indication that interworking without N26 is supported, then the UE initiates Attach with PDN connectivity request with request type "handover".

In inter-system redirection, the UE uses the emergency indication in the RRC message as specified in clause 6.2.2 of TS 36.331 [16] and E-UTRAN provides the emergency indication to MME during Tracking Area Update or Attach procedure. For the handover procedure see clause 4.11.1.2.1, step 1.

7. After completion of the mobility procedure to EPS or as part of the 5GS to EPS handover procedure (see clause 4.11.1.2.1), the SMF/PGW re-initiates the setup of the dedicated bearer for IMS voice, mapping the 5G QoS to EPC QoS parameters. The PGW-C+SMF behaves as specified in clause 4.9.1.3.1. The PGW-C+SMF reports about Successful Resource Allocation and Access Network Information if subscribed by PCF.
8. The IMS voice session establishment is continued.

At least for the duration of the voice call in EPS the E-UTRAN is configured to not trigger any handover to 5GS.

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.8.2.3]

At inter-system change from N1 mode to S1 mode in EMM-IDLE mode when: ( PDU SEESION ACTIVE )

- a) the UE supports non-IP PDN type and at least one PDU session is active; or
- b) the UE does not support non-IP PDN type and at least one PDU session of IPv4, IPv6 or IPv4v6 PDU session type is active,

the UE shall proceed as follows:

- a) if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode and the UE has received an "interworking without N26 interface supported" indication from the network, the UE shall:
  - 1) enter substates EMM-DEREGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE;
  - 2) map the PDU session(s) which the UE intends to transfer to EPS to the default EPS bearer context of the corresponding PDN connection(s) as specified in subclause 6.1.4.2; and

- 3) initiate an EPS attach procedure and include a PDN CONNECTIVITY REQUEST message with request type set to "handover" in the ATTACH REQUEST message to activate a default EPS bearer context for one of the active PDU sessions which the UE intends to transfer to EPS.

After successful completion of the EPS attach procedure, the UE shall reset the registration attempt counter and the attach attempt counter (see 3GPP TS 24.301 [15]) and attempt to activate each of the other default EPS bearer contexts, if any, by initiating a stand-alone PDN connectivity procedure with request type set to "handover" in the PDN CONNECTIVITY REQUEST message; and

- b) otherwise, enter substates EMM-REGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE and initiate a tracking area update procedure (see 3GPP TS 24.301 [15]).

At inter-system change from N1 mode to S1 mode in EMM-IDLE mode when: ( NO PDU SESSION )

- a) the UE supports non-IP PDN type and no PDU session is active; or
- b) the UE does not support non-IP PDN type and no PDU session of IPv4, IPv6 or IPv4v6 PDU session type is active,

the UE shall enter substates EMM-DEREGISTERED.NORMAL-SERVICE and 5GMM-DEREGISTERED.NO-CELL-AVAILABLE, and initiate an attach procedure.

At inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, the UE shall:

- a) enter substate 5GMM-REGISTERED.NORMAL-SERVICE and substate EMM-REGISTERED.NO-CELL-AVAILABLE;
- b) map the default EPS bearer context(s) of the PDN connection(s) which the UE intends to transfer to 5GS, if any, to the corresponding PDU session(s) as specified in subclause 6.1.4.2; and
- c) initiate the registration procedure for mobility and periodic registration update indicating "mobility registration updating" in the 5GS registration type IE of the REGISTRATION REQUEST message (see subclause 5.5.1.3).

After having successfully registered in N1 mode the UE shall reset the registration attempt counter and the attach attempt counter (see 3GPP TS 24.301 [15]) and:

- a) if the UE supports the PDU session establishment procedure with request type set to "existing PDU session" to transfer a PDN connection from S1 mode to N1 mode and the UE has received an "interworking without N26 interface supported" indication from the network, attempt to transfer the PDN connection(s) which the UE intends to transfer to 5GS, if any, from S1 mode to N1 mode by initiating the PDU session establishment procedure with request type set to "existing PDU session"; and
- b) otherwise, establish PDU session(s) corresponding to the PDN connection(s) which the UE intends to transfer to 5GS, if any, by initiating the PDU session establishment procedure with request type set to "initial request".

See subclause 5.1.4.3 for coordination between 5GMM and EMM and subclause 6.1.4.2 for coordination between 5GSM and ESM.

[TS 38.331, clause 5.3.11]

UE shall:

- 1> reset MAC;
- 1> if T302 is running:
  - 2> stop timer T302;
  - 2> perform the actions as specified in 5.3.14.4;

- 1> stop all timers that are running except T320 and T325;

1> discard the UE Inactive AS context;

1> set the variable *pendingRnaUpdate* to *false*, if that is set to *true*;

1> discard the  $K_{gNB}$ , the  $K_{RRCenc}$  key, the  $K_{RRCint}$ , the  $K_{UPint}$  key and the  $K_{UPenc}$  key, if any;

1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity and SDAP for all established RBs;

1> indicate the release of the RRC connection to upper layers together with the release cause;

1> enter RRC\_IDLE and perform cell selection as specified in TS 38.304 [20], except if going to RRC\_IDLE was triggered by selecting an inter-RAT cell while T311 was running;

1> if going to RRC\_IDLE was triggered by reception of the *RRCRelease* message including a *waitTime*:

2> start timer T302 with the value set to the *waitTime*;

2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2'.

11.1.2.3

Test description

11.1.2.3.1

Pre-test conditions

System Simulator:

- 2 cells

- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2.

- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], sub-clause 4.4.3.1.1.

UE:

- None

Preamble:

- With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established

- The UE is switched-off

- With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], with one IMS PDU session on NR Cell 1, Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

11.1.2.3.2 Test procedure sequence

Table 11.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		
1	The SS configures: - E-UTRA Cell 1 as "Suitable neighbour intra-frequency cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3.	-	-	-	-
-	EXCEPTION: Unless otherwise stated the following messages are exchange on NR Cell 1.	-	-	-	-
2	User initiates a MMTEL call.	-	-	-	-
3	Check: Does the UE transmits an <i>RRCSetupRequest</i> message?	-->	NR RRC: <i>RRCSetupRequest</i>	1	P
4	The SS transmits an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>	-	-
5	Cehck: Does the UE transmits an <i>RRCSetupComplete</i> message and a SERVICE REQUEST message?	-->	NR RRC: <i>RRCSetupComplete</i> 5GMM: SERVICE REQUEST	1	P
6	The SS transmits an <i>RRCRelease</i> message.	<--	NR RRC: <i>RRCRelease</i>	-	-
-	EXCEPTION: Unless otherwise stated the following messages are exchange on E-UTRA Cell 1.	-	-	-	-
7	The UE transmits an <i>RRCCConnectionRequest</i> message on the cell specified in the test case.	-->	RRC: <i>RRCCConnectionRequest</i>	-	-
8	SS transmits an <i>RRCCConnectionSetup</i> message.	<--	RRC: <i>RRCCConnectionSetup</i>	-	
-	EXCEPTION: Steps 8a1 to 8b18 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation.	-	-	-	-
8a1	If the UE tries to preserve the IP address of the PDN connection then check does the UE transmits an ATTACH REQUEST message?	-->	RRC: <i>RRCCConnectionSetupComplete</i> NAS: ATTACH REQUEST	2	P
8b1	Else check: does the UE transmit a TRACKING AREA UPDATE REQUEST message?	-->	RRC: <i>RRCCConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST	2	P
8b2	The SS transmites a TRACKING AREA UPDATE REJECT message to UE.	<--	RRC: <i>DLInformationTransfer</i> NAS: TRACKING AREA UPDATE REQUEST REJECT	-	-
8b3	The UE transmits an ATTACH REQUEST message.	-->	RRC: <i>ULInformationTransfer</i> NAS: ATTACH REQUEST	-	-
9-20	Steps 5 to 16 of the generic test procedure for UE registration (TS 36.508 [2] Table 4.5.2.3-1)	-	-	-	-
-	EXCEPTION: In parallel to the events described in steps 10 to 16 the UE may perform IMS re-registration on EUTRAN assteps as defined in TS 34.229-1 [35] subclause C.46	-	-	-	-
21-28	Steps 7-14 from the Generic Test Procedure for MTSI MO speech call establishment (TS 36.508 [2] table 4.5A.6.3-1) are performed.	-	-	-	-
29	The SS waits 1 second.	-	-	-	-
30	Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.32.	-	-	-	-

11.1.2.3.3

Specific message contents

Table 11.1.2.3.3-0: REGISTRATION ACCEPT (preamble; step 14, TS 38.508-1 [4], Table 4.5.2.2-2)

Derivation path: TS 38.508-1[4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
Extended protocol discriminator	'0111 1110'B	5GS mobility management messages	
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
5GS network feature support	'0100 0001 0000 0000'B	Interworking without N26 interface supported	

Table 11.1.2.3.3-1: RRCSetupRequest (step 3, table 11.1.2.3.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.6.1-23			
Information Element	Value/remark	Comment	Condition
RRCSetupRequest ::= SEQUENCE {			
rrcSetupRequest SEQUENCE {			
establishmentCause	Mo-Voicecall		
}			
}			

Table 11.1.2.3.3-2: SERVICE REQUEST (step 5, table 11.1.2.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-16			
Information Element	Value/Remark	Comment	Condition
Service type	'0001'B	data	
Uplink data status	Present	PSI bit corresponding to IMS PDN needs to be set	

Table 11.1.2.3.3-3: RRCRelease (step 6, table 11.1.2.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition



RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
redirectedCarrierInfo CHOICE {			
eutra.SEQUENCE{			
eutraFrequency	Downlink EARFCN of E-UTRA cell 1		
cnType	epc		
}			
}			
}			
}			
}			
}			

Table 11.1.2.3.3-3A: ATTACH REQUEST (step 8a1, table 11.1.2.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4.			
Information Element	Value/Remark	Comment	Condition
NAS key set identifier	KSI <sub>ASME</sub> that was created when the UE last registered to EPC E-UTRA		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI.		
Old GUTI type	"Native GUTI"		
ESM message container	PDN CONNECTIVITY REQUEST message to active PDU sessions which the UE intends to transfer to EPS.		

Table 11.1.2.3.3-3B: PDN CONNECTIVITY REQUEST (Table 11.1.2.3.3-3A)

Derivation Path: TS 36.508 [7], Table 4.7.3-20			
Information Element	Value/remark	Comment	Condition

EPS bearer identity	0	No EPS bearer identity assigned, for coding see Table 9.11.4.8.1 in TS 24.501 [22]	
Procedure transaction identity	Any value from 1 to 254		
PDN connectivity request message identity	'1101 0000'B	PDN connectivity request	
Request type	'010'B	Handover	
PDN type	Any value between '001'B, '010'B, '011'B and '100'B	The allowed values are respectively IPv4, IPv6, IPv4v6 and "unused but interpreted as IPv6 by the network"	
Protocol configuration options	PDU session ID of 5GS PDU session		

Table 11.1.2.3.3-4: TRACKING AREA UPDATE REQUEST (step 8b1, table 11.1.2.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-27, condition NR.			
Information Element	Value/Remark	Comment	Condition
"Active" flag	0001	Bearer Establishment requested	
EPS bearer context status	Present	EBI corresponding to active PDU Sessions need to be set to 1	
NAS key set identifier	KSI <sub>ASME</sub> that was created when the UE last registered to EPC E-UTRA		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI.		
Old GUTI type	"Native GUTI"		
UE status	"UE is in 5GMM-REGISTERED state"		

Table 11.1.2.3.3-5: TRACKING AREA UPDATE REJECT (step 8b2, table 11.1.2.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-26.			
Information Element	Value/Remark	Comment	Condition
EMM cause	'0000 1001'B	#9 "UE identity cannot be derived by the network"	

Table 11.1.2.3.3-6: ATTACH REQUEST (step 8b3, table 11.1.2.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4.			
Information Element	Value/Remark	Comment	Condition
IMSI	IMSI of the UE		

### 11.1.3 MO MMTEL voice call setup from NR RRC\_CONNECTED / EPS Fallback with handover / Single registration mode with N26 interface / Success

#### 11.1.3.1 Test Purpose (TP)

(1)

*with* { UE supporting both S1 mode and N1 mode and operating in single-registration mode, and, the Network has indicated "interworking without N26 interface not supported", **and**, the UE is in NR RRC\_CONNECTED state after having established connection with *establishmentCause* set to 'mo-Data', and, the UE is receiving and transmitting PS data }

*ensure that* {

*when* { User initiates a MMTEL call, the MO IMS voice session establishment has been initiated and the UE receives a *MobilityFromNRCommand* message which includes *targetRAT-Type* set to *eutra* }

*then* { UE performs a handover to the E-UTRA including a TAU procedure, **and**, while the UE continues receiving and transmitting PS data the UE successfully completes the MO MMTEL call in EPS }

}

#### 11.1.3.2 Conformance requirements

References: The conformance requirements covered in the present test case are specified in: TS 23.502, clauses 4.13.6.1, TS 24.501, clauses 4.8.2.2, 5.5.1.2.2, 5.5.1.2.4, 5.1.4.2 and 6.1.4.1, TS 38.331, clause 5.4.3.3 and 5.4.3.4. Unless otherwise stated these are Rel-15 requirements.

[TS 23.502, clause 4.13.6.1]

Figure 4.13.6.1-1 describes the EPS fallback procedure for IMS voice.

When the UE is served by the 5G System, the UE has one or more ongoing PDU Sessions each including one or more QoS Flows. The serving PLMN AMF has sent an indication towards the UE during the Registration procedure that IMS voice over PS session is supported, see clause 5.16.3.10 in TS 23.501 [2] and the UE has registered in the IMS. If N26 is not supported, the serving PLMN AMF sends an indication towards the UE during the Registration procedure that interworking without N26 is supported, see clause 5.17.2.3.1 in TS 23.501 [2].

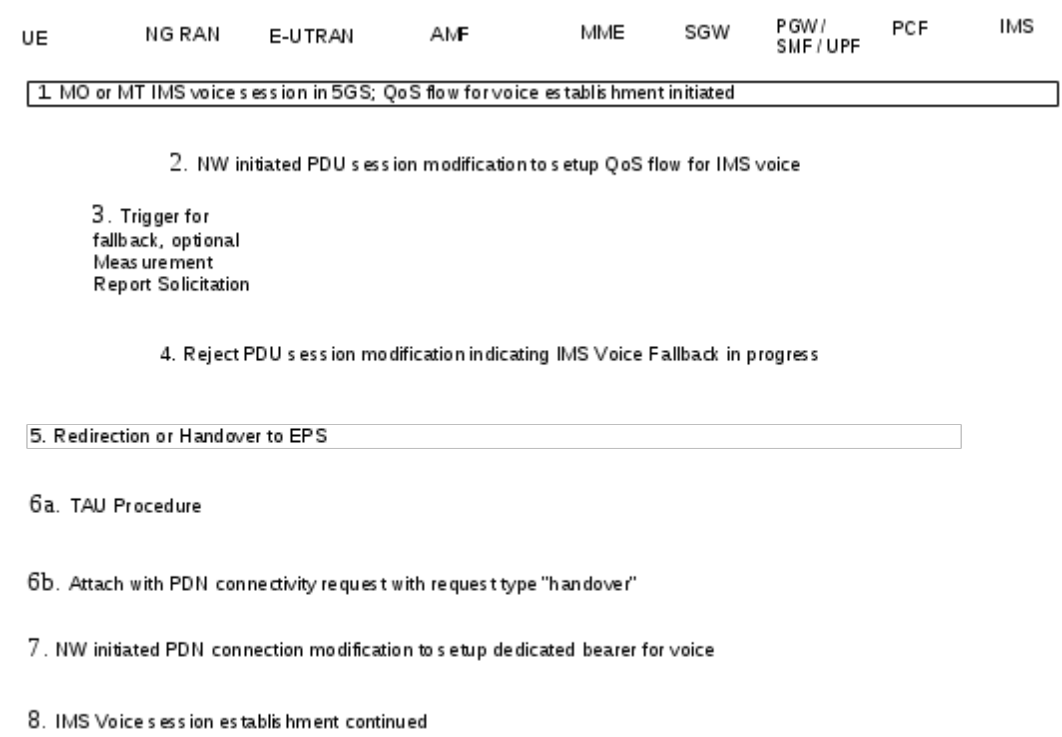


Figure 4.13.6.1-1: EPS Fallback for IMS voice

- 1. UE camps on NG-RAN in the 5GS and an MO or MT IMS voice session establishment has been initiated.
- 2. Network initiated PDU Session modification to setup QoS flow for voice reaches the NG-RAN (see N2 PDU Session Request in clause 4.3.3).
- 3. NG-RAN is configured to support EPS fallback for IMS voice and decides to trigger fallback to EPS, taking into account UE capabilities, indication from AMF that "Redirection for EPS fallback for voice is possible" (received as part of initial context setup as defined in TS 38.413 [10]), network configuration (e.g. N26 availability configuration) and radio conditions. If NG-RAN decides not to trigger fallback to EPS, then the procedure stops here and following steps are not executed.

NG-RAN may initiate measurement report solicitation from the UE including E-UTRAN as target.

- NOTE 1: If AMF has indicated that "Redirection for EPS fallback for voice is not possible", then AN Release via inter-system redirection to EPS is not performed in step 5.
- 4. NG-RAN responds indicating rejection of the PDU Session modification to setup QoS flow for IMS voice received in step 2 by PDU Session Response message towards the PGW-C+SMF (or H-SMF+P-GW-C via V-SMF, in case of roaming scenario) via AMF with an indication that mobility due to fallback for IMS voice is ongoing. The PGW-C+SMF maintains the PCC rule(s) associated with the QoS Flow(s).
  - 5. NG-RAN initiates either handover (see clause 4.11.1.2.1), or AN Release via inter-system redirection to EPS (see clause 4.2.6 and clause 4.11.1.3.2), taking into account UE capabilities. The PGW-C+SMF reports change of the RAT type if subscribed by PCF as specified in clause 4.11.1.2.1, or clause 4.11.1.3.2.6. When the UE is connected to EPS, either 6a or 6b is executed
  - 6a. In the case of 5GS to EPS handover, see clause 4.11.1.2.1, and in the case of inter-system redirection to EPS with N26 interface, see clause 4.11.1.3.2. In either case the UE initiates TAU procedure; or

6b. In the case of inter-system redirection to EPS without N26 interface, see clause 4.11.2.2. If the UE supports Request Type flag "handover" for PDN connectivity request during the attach procedure as described in clause 5.3.2.1 of TS 23.401 [13] and has received the indication that interworking without N26 is supported, then the UE initiates Attach with PDN connectivity request with request type "handover".

In inter-system redirection, the UE uses the emergency indication in the RRC message as specified in clause 6.2.2 of TS 36.331 [16] and E-UTRAN provides the emergency indication to MME during Tracking Area Update or Attach procedure. For the handover procedure see clause 4.11.1.2.1, step 1.

7. After completion of the mobility procedure to EPS or as part of the 5GS to EPS handover procedure (see clause 4.11.1.2.1), the SMF/PGW re-initiates the setup of the dedicated bearer for IMS voice, mapping the 5G QoS to EPC QoS parameters. The PGW-C+SMF behaves as specified in clause 4.9.1.3.1. The PGW-C+SMF reports about Successful Resource Allocation and Access Network Information if subscribed by PCF.

8. The IMS voice session establishment is continued.

At least for the duration of the voice call in EPS the E-UTRAN is configured to not trigger any handover to 5GS.

[TS 24.501, clause 4.8.2.2]

See subclause 5.1.4.2 for coordination between 5GMM and EMM and subclause 6.1.4.1 for coordination between 5GSM and ESM.

[TS 24.501, clause 5.5.1.2.2]

If the UE supports S1 mode, the UE shall:

- set the S1 mode bit to "S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;
- include the S1 UE network capability IE in the REGISTRATION REQUEST message; and
- if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode, set the HO attach bit to "attach request message containing PDN connectivity request with request type set to handover to transfer PDU session from N1 mode to S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

[TS 24.501, clause 5.5.1.2.4]

If the UE included S1 mode supported indication in the REGISTRATION REQUEST message, the AMF supporting interworking with EPS shall set the IWK N26 bit to either:

- a) "interworking without N26 interface not supported" if the AMF supports N26 interface ; or
- b) "interworking without N26 interface supported" if the AMF does not support N26 interface

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

The UE supporting S1 mode shall operate in the mode for interworking with EPS as follows:

- a) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface not supported", the UE shall operate in single-registration mode;
- b) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE supports dual-registration mode, the UE may operate in dual-registration mode; or

NOTE 3: The registration mode used by the UE is implementation dependent.

- c) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE only supports single-registration mode, the UE shall operate in single-registration mode.

The UE shall treat the received interworking without N26 interface indicator for interworking with EPS as valid in the entire PLMN and its equivalent PLMN(s).

The network informs the UE about the support of specific features, such as IMS voice over PS session, emergency services or emergency services fallback, in the 5GS network feature support information element. In a UE with IMS voice over PS session capability, the IMS voice over PS session indicator, the Emergency services support indicator, and the Emergency services fallback indicator shall be provided to the upper layers. The upper layers take the IMS voice over PS session indicator into account when selecting the access domain for voice sessions or calls. When initiating an emergency call, the upper layers also take the IMS voice over PS session indicator, the Emergency services support indicator, and the Emergency services fallback indicator into account for the access domain selection.

[TS 24.501, clause 5.1.4.2]

At inter-system change from N1 mode to S1 mode when there is at least one active PDU session for which interworking with EPS is supported as specified in subclause 6.1.4.1, the UE shall enter substates EMM-REGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE and initiate a tracking area updating procedure (see 3GPP TS 24.301 [15]).

[TS 24.501, clause 6.1.4.1]

Upon inter-system change from N1 mode to S1 mode, the UE shall create the default EPS bearer context and the dedicated EPS bearer context(s) based on the parameters of the mapped EPS bearer contexts or the associations between QoS flow and mapped EPS bearer in the PDU session, if available. The EPS bearer identity assigned for the QoS flow of the default QoS rule becomes the EPS bearer identity of the default bearer in the corresponding PDN connection. If there is no EPS bearer identity assigned to the QoS flow of the default QoS rule, the UE shall release locally the PDU session. If there is no EPS bearer identity assigned to the QoS flow(s) which is not associated with the default QoS rule, the UE shall locally delete the QoS rules and the QoS flow level QoS parameters associated with the QoS flow(s). The UE uses the parameters from each PDU session for which interworking with EPS is supported to create corresponding default EPS bearer context and optionally dedicated EPS bearer context(s) as follows:

- a) the PDU session type of the PDU session shall be mapped to the PDN type of the default EPS bearer context as follows:
  - 1) the PDN type shall be set to "non-IP" if the PDU session type is "Ethernet" or "Unstructured";
  - 2) the PDN type shall be set to "IPv4" if the PDU session type is "IPv4";
  - 3) the PDN type shall be set to "IPv6" if the PDU session type is "IPv6"; and
  - 4) the PDN type shall be set to "IPv4v6" if the PDU session type is "IPv4v6";
- b) the PDU address of the PDU session shall be mapped to the PDN address of the default EPS bearer context as follows:
  - 1) the PDN address of the default EPS bearer context is set to the PDU address of the PDU session, if the PDU session type is "IPv4", "IPv6" or "IPv4v6"; and
  - 2) the PDN address of the default EPS bearer context is set to zero, if the PDU session type is "Ethernet" or "Unstructured";
- c) the DNN of the PDU session shall be mapped to the APN of the default EPS bearer context;
- d) the APN-AMBR and extended APN-AMBR received in the parameters of the default EPS bearer context of the mapped EPS bearer contexts shall be mapped to the APN-AMBR and extended APN-AMBR of the default EPS bearer context;

- e) for each PDU session in state PDU SESSION ACTIVE, PDU SESSION MODIFICATION PENDING or PDU SESSION INACTIVE PENDING the UE shall set the state of the mapped EPS bearer context(s) to BEARER CONTEXT ACTIVE; and
- f) for any other PDU session the UE shall set the state of the mapped EPS bearer context(s) to BEARER CONTEXT INACTIVE.

Additionally, for each mapped EPS bearer context or the association between QoS flow and mapped EPS bearer in the PDU session:

- a) the EPS bearer identity shall be set to the EPS bearer identity received in the mapped EPS bearer context, or the EPS bearer identity associated with the QoS flow;
- b) the EPS QoS parameters shall be set to the mapped EPS QoS parameters of the EPS bearer received in the mapped EPS bearer context, or the EPS QoS parameters associated with the QoS flow;
- c) the extended EPS QoS parameters shall be set to the mapped extended EPS QoS parameters of the EPS bearer received in the mapped EPS bearer context, or the extended EPS QoS parameters associated with the QoS flow; and
- d) the traffic flow template shall be set to the mapped traffic flow template of the EPS bearer received in the mapped EPS bearer context, or the stored traffic flow template associated with the QoS flow, if available.

After inter-system change from N1 mode to S1 mode, the UE shall associate the PDU session identity, the S-NSSAI, and the session-AMBR with the default EPS bearer context, and for each EPS bearer context mapped from one or more QoS flows, associate the QoS rule(s) for the QoS flow(s) and the QoS flow description(s) for the QoS flow(s) with the EPS bearer context.

After inter-system change from N1 mode to S1 mode, the UE and the SMF shall maintain the PDU session type of the PDU session until the PDN connection corresponding to the PDU session is released if the UE supports non-IP PDN type and the PDU session type is "Ethernet" or "Unstructured".

After inter-system change from N1 mode to S1 mode, the UE and the SMF shall maintain the always-on PDU session indication.

After inter-system change from N1 mode to S1 mode, the UE and the SMF shall maintain the maximum number of supported packet filters until the PDN connection corresponding to the PDU session is released.

[TS 38.331, clause 5.4.3.3]

The UE shall:

- 1> if T390 is running:
  - 2> stop timer T390 for all access categories;
  - 2> perform the actions as specified in 5.3.14.4;
- 1> if the *targetRAT-Type* is set to *eutra*:
  - 2> consider inter-RAT mobility as initiated towards E-UTRA;
  - 2> forward the *nas-SecurityParamFromNR* to the upper layers, if included;
- 1> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT.

[TS 38.331, clause 5.4.3.4]

Upon successfully completing the handover, at the source side the UE shall:

- 1> reset MAC;

- 1> stop all timers that are running;
- 1> release *ran-NotificationAreaInfo*, if stored;
- 1> release the AS security context including the  $K_{RR_{Cenc}}$  key, the  $K_{RR_{Cint}}$  key, the  $K_{UP_{int}}$  key and the  $K_{UP_{enc}}$  key, if stored;
- 1> release all radio resources, including release of the RLC entity and the MAC configuration;
- 1> if the E-UTRA *RRCCConnectionReconfiguration* message included in the received *MobilityFromNRCommand* does not include *fullConfig*:

2> maintain source RAT configuration of PDCP and SDAP for applicable RBs which is used for target RAT RBs;
- 1> else:

2> release the associated PDCP entity and SDAP entity for all established RBs;
- 1> indicate the release of the RRC connection to upper layers together with the release cause 'other'.

11.1.3.3

Test Description

11.1.3.3.1

Pre-test conditions

System Simulator:

- 2 cells
- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2.
- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], sub-clause 4.4.3.1.1.
- N26 interface is configured.

UE:

None.

Preamble:

- With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established.
- The UE is switched-off.
- With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR) with at least one Internet PDU session and one IMS PDU session on NR Cell 1, in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned.



11.1.3.3.2

Test procedure sequence

Table 11.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	The SS configures: - E-UTRA Cell 1 as "Suitable neighbour intra-frequency cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3.				
-	The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
2	The SS transmits a <i>Paging</i> message.	<--	NR RRC: <i>Paging</i>	-	-
3	The UE transmits an <i>RRCSetupRequest</i> message.	-->	NR RRC: <i>RRCSetupRequest</i>	-	-
4-9	Steps 3 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are executed to successfully complete the service request procedure.	-	-	-	-
-	EXCEPTION: Step 10a1 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation				
10a1	IF pc_IP_Ping = TRUE, THEN Check: Does the test result of generic test procedure 1a1-1b2 in TS 38.508-1 [4] subclause 4.9.1 indicate that the UE is capable of exchanging IP data?			1	P
11	Make the UE attempt an MTSI MO Speech Call.	-	-	-	-
12-16	Steps 1-5 of the MTSI MO speech call for 5GS procedure according to Annex A.9.1 of TS 34.229-5 [41] take place.	-	-	-	-
17	The SS transmits a <i>MobilityFromNRCommand</i> message which includes targetRAT-Type set to eutra according to 38.508-1 [4] Table 4.6.1-8.	<--	NR RRC: <i>MobilityFromNRCommand</i>	-	-
-	The following messages are to be observed on E-UTRA Cell 1 unless explicitly stated otherwise.	-	-	-	-
18	Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message to confirm the successful completion of handover?	-->	RRC: <i>RRCConnectionReconfigurationComplete</i>	1	P
19	The UE transmits an <i>ULInformationTransfer</i> message on the cell specified in the test case. This message includes a TRACKING AREA UPDATE REQUEST message.	-->	RRC: <i>ULInformationTransfer</i> NAS: TRACKING AREA UPDATE REQUEST	1	P
20-23	Steps 4a1-6 of the generic test procedure in TS 38.508-1 [4] Table 4.9.7.2.2-1 for N1 to S1 Inter mode change with condition 'connected without release' & 'mapped 5G security context' are performed to make sure successfully camped on E-UTRAN cell upon mobility from NR.	-	-	-	-
24	The SS configures a new RLC-UM data radio bearer with condition DRB (0,1), associated with the dedicated EPS bearer context. <i>RRCConnectionReconfiguration</i> message contains the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message. EPS bearer context #4 (QCI 1) according to TS 36.508 [7] Table 6.6.2-1: Reference dedicated EPS bearer contexts. Reference dedicated EPS bearer contexts is to establish the dedicated EPS bearer context on IMS PDN.	<--	RRC: <i>RRCConnectionReconfiguration</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	-	-
-	EXCEPTION: In parallel to the events	-	-	-	-

	described in steps 25-28 below, the steps specified in table 11.1.3.3.2-2 will take place.				
25	The UE transmits an <i>RRCCConnectionReconfigurationComplete</i> message.	-->	RRC: <i>RRCCConnectionReconfigurationComplete</i>	-	-
26	The UE transmits an <i>ULInformationTransfer</i> message including the ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message.	-->	RRC: <i>ULInformationTransfer</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	-	-
27	The SS waits 1 second for call duration.	-	-	-	-
	EXCEPTION: Step 28a1 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation				
28a1	IF pc_IP_Ping = TRUE, THEN Check: Does the test result of generic test procedure 1a1-1b2 in TS 38.508-1 [4] subclause 4.9.1 indicate that the UE is capable of exchanging IP data?			1	P
29	Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.32.	-	-	-	-

Table 11.1.3.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
-	EXCEPTION: Steps 1a1 to 1b7 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that take place if a capability is supported	-	-	-	-
1a1-a2	The UE performs IMS re-registration on EUTRAN as per steps 1-2 as defined in TS 34.229-1 [35] C.46.	-	-	-	-
1a3-1a6	Steps 1-4 clause A.9.2 “EPS Fallback for Voice Call / steps after fallback / 5GS” of TS 34.229-5 [41] take place.	-	-	-	-
1a7	Check: Does the UE perform step 5 of the generic procedure “EPS Fallback for Voice Call / steps after fallback / 5GS” as defined in Appendix A.9.2 of TS 34.229-5 [41]	-->	SIP: ACK	1	P

11.1.3.3.3 Specific message contents

Table 11.1.3.3.3-1: REGISTRATION REQUEST (preamble, Table 11.1.3.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GMM capability			
S1 mode	'1'B	S1 mode supported	
S1 UE network capability	Present but contents not checked		

Table 11.1.3.3.3-2: REGISTRATION ACCEPT (preamble, Table 11.1.3.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS network feature support			
IMS- VoPS-3GPP	'1'B	IMS voice over PS session supported over 3GPP access	
IWK N26	'0'B	Interworking without N26 interface not supported	

Table 11.1.3.3.3-3: PDU SESSION ESTABLISHMENT ACCEPT (preamble for PDU Session for PS data, Table 11.1.3.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.2-2, condition Interworking_with_EPS
---

Table 11.1.3.3.3-4: PDU SESSION ESTABLISHMENT ACCEPT (preamble for IMS PDU Session, Table 11.1.3.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.2-2, condition Interworking_with_EPS, IMS_DNN_Requested
--

Table 11.1.3.3.3-5: Void

Table 11.1.3.3.3-6: MobilityFromNRCommand (step 17, Table 11.1.3.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.6.1-8			
Information Element	Value/remark	Comment	Condition
MobilityFromNRCommand ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier		
criticalExtensions CHOICE {			
mobilityFromNRCommand SEQUENCE {			
targetRAT-Type	eutra		
targetRAT-MessageContainer	RRCConnectionReconfiguration		
nas-SecurityParamFromNR	8 LSB of the downlink NAS COUNT		
}			
}			
}			
}			

Table 11.1.3.3.3-7: RRCConnectionRegonfiguration (Table 11.1.3.3.3-6)

Derivation path: TS 36.508-1 [4], Table 4.6.1-8 condition HO-TO-EUTRA(2,0)
--

Table 11.1.3.3.3-8: MobilityControllInfo (Table 11.1.3.3.3-7)

Derivation path: TS 36.508 [7], Table 4.6.5-1			
Information Element	Value/remark	Comment	Condition
MobilityControllInfo ::= SEQUENCE {			
targetPhysCellId	PhysicalCellIdentity of E-UTRA Cell 1		
carrierFreq SEQUENCE {			
dl-CarrierFreq	Same downlink EARFCN as used for E-UTRA Cell 1		
}			
carrierFreq	Not present		Band > 64
carrierBandwidth SEQUENCE {			
dl-Bandwidth	Downlink system bandwidth under test.		
ul-Bandwidth	Uplink Bandwidth under test.		FDD
ul-Bandwidth	Not present		TDD
}			
additionalSpectrumEmission	1		HO-to-EUTRA
carrierFreq-v9e0 SEQUENCE {			Band > 64
dl-CarrierFreq-v9e0	Same downlink EARFCN as used for E-UTRA Cell 1		
}			
}			

Condition	Explanation
FDD	FDD cell environment
TDD	TDD cell environment
Band > 64	If band > 64 is selected

Table 11.1.3.3.3-9: TRACKING AREA UPDATE REQUEST (step 19, Table 11.1.3.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-27, condition NR.			
Information Element	Value/remark	Comment	Condition

EPS update type			
EPS update type Value	'000'B	TA updating	
"Active" flag	'0'B	No bearer establishment requested	
NAS key set identifier	the eKSI indicating the 5G NAS security context value assigned at the initial registration when the UE entered N1		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI to which the NR cell belonged to (the cell in which the UE was when in N1 before moving to S1).		
UE radio capability information update needed	'1'B	UE radio capability information update needed	
EPS bearer context status	Present, Content not checked	EBI corresponding to active PDU Sessions need to be set to 1	
Old GUTI type	"Native GUTI"		
UE status	"UE is in 5GMM-REGISTERED state"		
NOTE: The message shall be integrity protected using the 5GS security context available in the UE.			

11.1.4 MO MMTEL voice call setup from NR RRC\_CONNECTED / EPS Fallback with redirection / Single registration mode with N26 interface / E-UTRAN cell reselection using cell status barred / Success

11.1.4.1 Test Purpose (TP)

(1)

*with* { UE supporting both S1 mode and N1 mode and operating in single-registration mode, and, the Network has indicated "interworking without N26 interface not supported", **and**, the UE in NR RRC\_CONNECTED state after having established connection with *establishmentCause* set to 'mo-Data', and, the UE receiving and transmitting PS data }

*ensure that* {

*when* { User initiates a MMTEL call, the MO IMS voice session establishment has been initiated and the UE receives a *RRCRelease* message which includes *redirectedCarrierInfo* indicating redirection to *eutra*, and, a higher ranked E-UTRA cell is found with cell status "barred" and a lower ranked E-UTRA cell is found which is not "barred" }

*then* { UE selects the not "barred" E-UTRA cell, performs a TAU procedure, **and**, while the UE continues receiving and transmitting PS data the UE successfully completes the MO MMTEL call in EPS }

}

11.1.4.2 Conformance requirements

References: The conformance requirements covered in the present test case are specified in: TS 23.502, clauses 4.13.6.1 and 4.11.1.3.2, TS 24.501, clauses 4.8.2.2, 5.1.4.2 and 6.1.4.1, TS 38.331, clauses 5.3.3.2, 5.3.3.3, 5.3.8.3 and 5.3.11; TS 36.304 clauses 5.2.4.4 and 5.3.1. Unless otherwise stated these are Rel-15 requirements.

[TS 23.502, clause 4.13.6.1]

Figure 4.13.6.1-1 describes the EPS fallback procedure for IMS voice.

When the UE is served by the 5G System, the UE has one or more ongoing PDU Sessions each including one or more QoS Flows. The serving PLMN AMF has sent an indication towards the UE during the Registration procedure that IMS voice over PS session is supported, see clause 5.16.3.10 in TS 23.501 [2] and the UE has registered in the IMS. If N26 is not supported, the serving PLMN AMF sends an indication towards the UE during the Registration procedure that interworking without N26 is supported, see clause 5.17.2.3.1 in TS 23.501 [2].

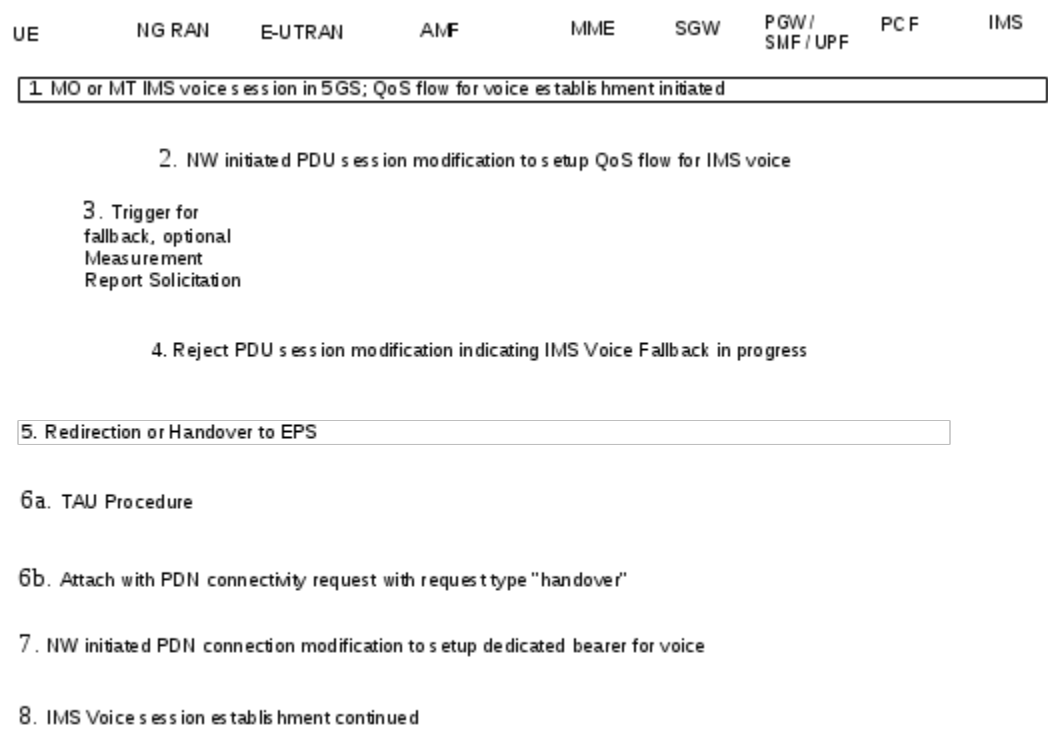


Figure 4.13.6.1-1: EPS Fallback for IMS voice

- 1. UE camps on NG-RAN in the 5GS and an MO or MT IMS voice session establishment has been initiated.
- 2. Network initiated PDU Session modification to setup QoS flow for voice reaches the NG-RAN (see N2 PDU Session Request in clause 4.3.3).
- 3. NG-RAN is configured to support EPS fallback for IMS voice and decides to trigger fallback to EPS, taking into account UE capabilities, indication from AMF that "Redirection for EPS fallback for voice is possible" (received as part of initial context setup as defined in TS 38.413 [10]), network configuration (e.g. N26 availability

configuration) and radio conditions. If NG-RAN decides not to trigger fallback to EPS, then the procedure stops here and following steps are not executed.

NG-RAN may initiate measurement report solicitation from the UE including E-UTRAN as target.

NOTE 1: If AMF has indicated that "Redirection for EPS fallback for voice is not possible", then AN Release via inter-system redirection to EPS is not performed in step 5.

4. NG-RAN responds indicating rejection of the PDU Session modification to setup QoS flow for IMS voice received in step 2 by PDU Session Response message towards the PGW-C+SMF (or H-SMF+P-GW-C via V-SMF, in case of roaming scenario) via AMF with an indication that mobility due to fallback for IMS voice is ongoing. The PGW-C+SMF maintains the PCC rule(s) associated with the QoS Flow(s).
5. NG-RAN initiates either handover (see clause 4.11.1.2.1), or AN Release via inter-system redirection to EPS (see clause 4.2.6 and clause 4.11.1.3.2), taking into account UE capabilities. The PGW-C+SMF reports change of the RAT type if subscribed by PCF as specified in clause 4.11.1.2.1, or clause 4.11.1.3.2.6. When the UE is connected to EPS, either 6a or 6b is executed
  - 6a. In the case of 5GS to EPS handover, see clause 4.11.1.2.1, and in the case of inter-system redirection to EPS with N26 interface, see clause 4.11.1.3.2. In either case the UE initiates TAU procedure; or
  - 6b. In the case of inter-system redirection to EPS without N26 interface, see clause 4.11.2.2. If the UE supports Request Type flag "handover" for PDN connectivity request during the attach procedure as described in clause 5.3.2.1 of TS 23.401 [13] and has received the indication that interworking without N26 is supported, then the UE initiates Attach with PDN connectivity request with request type "handover".

In inter-system redirection, the UE uses the emergency indication in the RRC message as specified in clause 6.2.2 of TS 36.331 [16] and E-UTRAN provides the emergency indication to MME during Tracking Area Update or Attach procedure. For the handover procedure see clause 4.11.1.2.1, step 1.

7. After completion of the mobility procedure to EPS or as part of the 5GS to EPS handover procedure (see clause 4.11.1.2.1), the SMF/PGW re-initiates the setup of the dedicated bearer for IMS voice, mapping the 5G QoS to EPC QoS parameters. The PGW-C+SMF behaves as specified in clause 4.9.1.3.1. The PGW-C+SMF reports about Successful Resource Allocation and Access Network Information if subscribed by PCF.
8. The IMS voice session establishment is continued.

At least for the duration of the voice call in EPS the E-UTRAN is configured to not trigger any handover to 5GS.

[TS 23.502, clause 4.11.1.3.2]

Clause 4.11.1.3.2 covers the case of idle mode mobility from 5GC to EPC. UE performs Tracking Area Update procedure in E-UTRA/EPS when it moves from NG-RAN/5GS to E-UTRA/EPS coverage area.

The procedure involves a Tracking Area Update to EPC and setup of default EPS bearer and dedicated bearers in EPC in steps 1-11 and re-activation, if required.



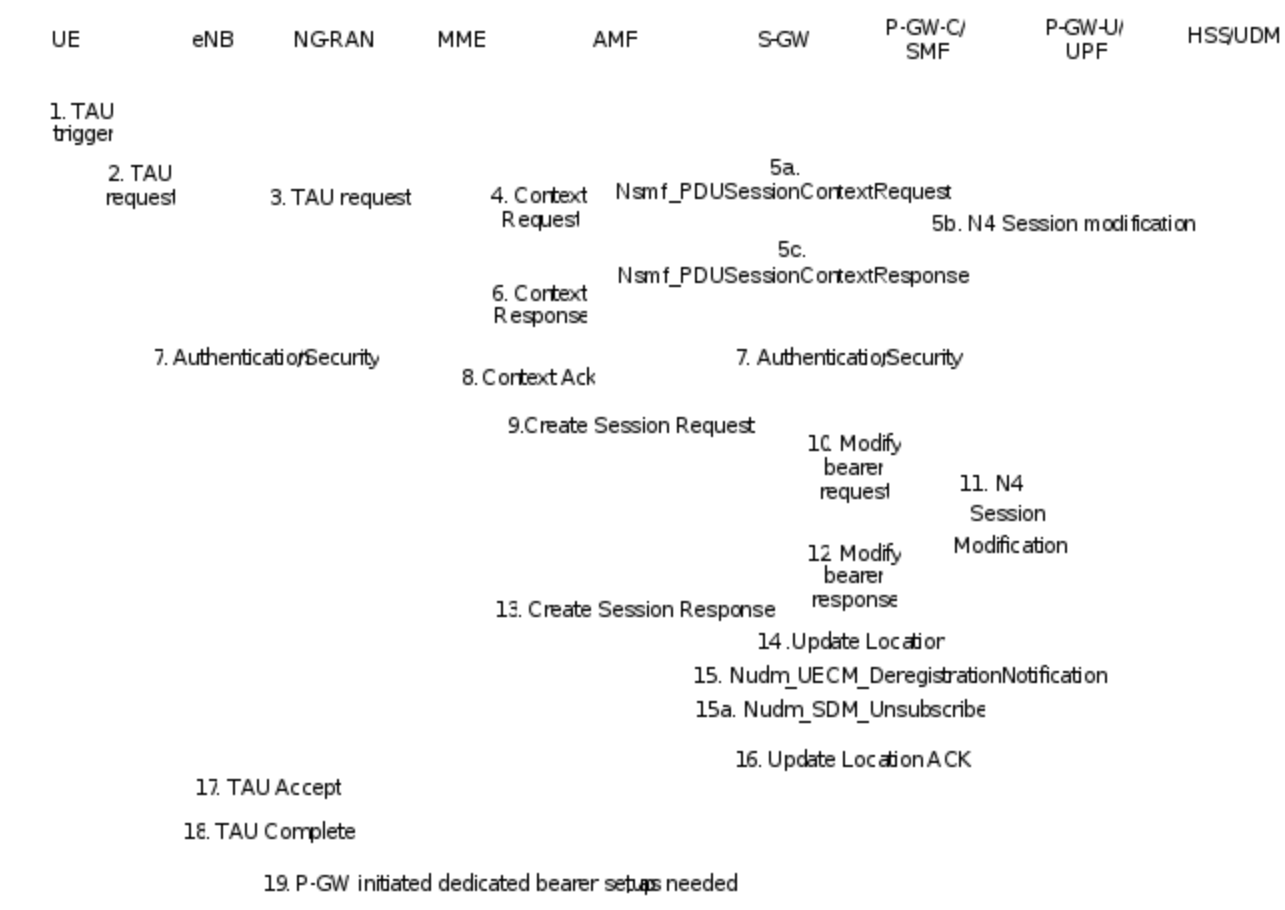


Figure 4.11.1.3.2-1: 5GS to EPS Idle mode mobility using N26 interface

The TAU procedure in TS 23.401 [13] is used with the following 5GS interaction:

1. Step 1 from clause 5.3.3.1 (Tracking Area Update procedure with Serving GW change) in TS 23.401 [13].
2. Step 2 from clause 5.3.3.1 (Tracking Area Update procedure with Serving GW change) in TS 23.401 [13] with the modification captured in clause 4.11.1.5.3.
- 3-4. Steps 3-4 from clause 5.3.3.1 (Tracking Area Update procedure with Serving GW change) in TS 23.401 [13].
- 5a. The AMF verifies the integrity of the TAU request message and requests the PGW-C+SMF to provide SM Context by using Nsmf\_PDUSession\_ContextRequest that also includes the mapped EPS Bearer Contexts. The AMF provides the target MME capability to SMF in the request to allow the SMF to determine whether to include EPS Bearer context for non-IP PDN Type or not. This step is performed with all the PGW-C+SMFs corresponding to PDU Sessions of the UE which are associated with 3GPP access and have EBI(s) allocated to them. In this step, if the AMF correctly validates the UE, then the AMF starts a timer.

NOTE 1: The AMF knows the MME capability to support non-IP PDN type or not through local configuration.

5b. For Non-roaming or roaming with local breakout scenario, if CN Tunnel Info is allocated by the PGW-U+UPF, the SMF sends N4 Session Modification Request to PGW-U+UPF to establish the tunnel for each EPS bearers, and PGW-U+UPF provides the PGW-U Tunnel Info for each EPS bearers to PGW-C+SMF.

NOTE2: In home routed roaming case, the CN Tunnel Info for each EPS bearer has been prepared by the PGW-C+SMF and provided to the V-SMF as specified in clause 4.11.1.4.1.

- 5c. SMF returns mapped EPS bearer contexts, which includes PGW-C control plane tunnel information of the PDN connection corresponding to the PDU session, EBI for each EPS bearer, PGW-U tunnel information for each EPS bearer, and EPS QoS parameters for each EPS bearer. For PDU Sessions with PDU Session Type Ethernet or Unstructured, the SMF provides SM Context for non-IP PDN Type.
6. The AMF responds with a Context Response message carrying mapped MM context (including mapped security context), Return preferred and SM EPS UE Context (default and dedicated GBR bearers) to the MME. If the verification of the integrity protection fails, the AMF returns an appropriate error cause. Return preferred is an optional indication by the AMF of a preferred return of the UE to the 5GS PLMN at a later access change to a 5GS shared network. The AMF may start an implementation specific (guard) timer for the UE context.
- 7 - 14. Steps 6-12 from clause 5.3.3.1 (Tracking Area Update procedure with Serving GW change) in TS 23.401 [13] are performed with following addition and modification:

In the step 10, If the QoS Flow associated with the default QoS rule has an EPS Bearer ID assigned, the PGW-C+SMF keeps the PDU Session (PDN connection) and for the remaining QoS Flows that do not have EPS bearer ID(s) assigned, the PGW-C+SMF deletes the PCC rule(s) associated with those QoS Flows and informs the PCF about the removed PCC rule(s).

In the step 11, the PGW-C+SMF requests the PGW-U+UPF to establish the tunnel for each EPS bearer by providing SGW-U Tunnel Info, and PGW-U Tunnel Info if the PGW-U Tunnel Info is allocated by the PGW-C+SMF.

In step 10, the PGW-C+SMF may need to report some subscribed event to the PCF by performing an SMF initiated SM Policy Association Modification procedure as defined in clause 4.16.5.

Step 9a from clause 5.3.3.1 (Tracking Area Update procedure with Serving GW change) in TS 23.401 [13] with the modification captured in clause 4.11.1.5.3

- 15a. The HSS+UDM invokes Nudm\_UECM\_DeregistrationNotification to notify the AMF associated with 3GPP access with reason as 5GS to EPS Mobility. If the timer started in step 6 is not running, the old AMF removes the UE context. Otherwise, the AMF may remove UE context when the timer expires. The AMF request the release of the PDU Session which is associated with 3GPP access, not expected to be transferred to EPC, i.e. no EBI(s) allocated to them, and corresponding to the PGW-C+SMF which is not contacted by AMF for SM context at step 5a. The AMF requests the release of the SM context in the V-SMF only, for Home Routed PDU Session with EBIs allocated. The 5GC may also keep UE context to allow the use of native security parameters when UE moves back from EPS to 5GS later.

Registration associated with the non-3GPP access in the AMF is not removed (i.e. an AMF that was serving the UE over both 3GPP and non-3GPP accesses does not consider the UE as deregistered over non 3GPP access and will remain registered and subscribed to subscription data updates in UDM).

When the UE decides to deregister over non-3GPP access or the old AMF decides not to maintain a UE registration for non-3GPP access anymore, the old AMF then deregisters from UDM by sending a Nudm\_UECM\_Deregistration service operation, unsubscribes from Subscription Data updates by sending an Nudm\_SDM\_Unsubscribe service operation to UDM and releases all the AMF and AN resources related to the UE.

- 16 - 18. Steps 17-21 from clause 5.3.3.1 (Tracking Area Update procedure with Serving GW change) in TS 23.401 [13] with the following modification:

The MME may provide the eNodeB with a PLMN list in the Handover Restriction List taking into account the last used 5GS PLMN ID and the Return preferred indication. The Handover Restriction List contains a list of PLMN IDs as specified by TS 23.251 [35] clause 5.2a for eNodeB functions.

The MME may not release the signaling connection with the UE based on the indication received in the step 1 that the UE is moving from 5GC.

19. [conditional] Step 19 from clause 4.11.1.2.1 applies.

[TS 24.501, clause 4.8.2.2]

See subclause 5.1.4.2 for coordination between 5GMM and EMM and subclause 6.1.4.1 for coordination between 5GSM and ESM.

[TS 24.501, clause 5.1.4.2]

At inter-system change from N1 mode to S1 mode when there is at least one active PDU session for which interworking with EPS is supported as specified in subclause 6.1.4.1, the UE shall enter substates EMM-REGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE and initiate a tracking area updating procedure (see 3GPP TS 24.301 [15]).

[TS 24.501, clause 6.1.4.1]

Upon inter-system change from N1 mode to S1 mode, the UE shall create the default EPS bearer context and the dedicated EPS bearer context(s) based on the parameters of the mapped EPS bearer contexts or the associations between QoS flow and mapped EPS bearer in the PDU session, if available. The EPS bearer identity assigned for the QoS flow of the default QoS rule becomes the EPS bearer identity of the default bearer in the corresponding PDN connection. If there is no EPS bearer identity assigned to the QoS flow of the default QoS rule, the UE shall release locally the PDU session. If there is no EPS bearer identity assigned to the QoS flow(s) which is not associated with the default QoS rule, the UE shall locally delete the QoS rules and the QoS flow level QoS parameters associated with the QoS flow(s). The UE uses the parameters from each PDU session for which interworking with EPS is supported to create corresponding default EPS bearer context and optionally dedicated EPS bearer context(s) as follows:

- a) the PDU session type of the PDU session shall be mapped to the PDN type of the default EPS bearer context as follows:
  - 1) the PDN type shall be set to "non-IP" if the PDU session type is "Ethernet" or "Unstructured";
  - 2) the PDN type shall be set to "IPv4" if the PDU session type is "IPv4";
  - 3) the PDN type shall be set to "IPv6" if the PDU session type is "IPv6"; and
  - 4) the PDN type shall be set to "IPv4v6" if the PDU session type is "IPv4v6";
- b) the PDU address of the PDU session shall be mapped to the PDN address of the default EPS bearer context as follows:
  - 1) the PDN address of the default EPS bearer context is set to the PDU address of the PDU session, if the PDU session type is "IPv4", "IPv6" or "IPv4v6"; and
  - 2) the PDN address of the default EPS bearer context is set to zero, if the PDU session type is "Ethernet" or "Unstructured";
- c) the DNN of the PDU session shall be mapped to the APN of the default EPS bearer context;
- d) the APN-AMBR and extended APN-AMBR received in the parameters of the default EPS bearer context of the mapped EPS bearer contexts shall be mapped to the APN-AMBR and extended APN-AMBR of the default EPS bearer context;
- e) for each PDU session in state PDU SESSION ACTIVE, PDU SESSION MODIFICATION PENDING or PDU SESSION INACTIVE PENDING the UE shall set the state of the mapped EPS bearer context(s) to BEARER CONTEXT ACTIVE; and

- f) for any other PDU session the UE shall set the state of the mapped EPS bearer context(s) to BEARER CONTEXT INACTIVE.

Additionally, for each mapped EPS bearer context or the association between QoS flow and mapped EPS bearer in the PDU session:

- a) the EPS bearer identity shall be set to the EPS bearer identity received in the mapped EPS bearer context, or the EPS bearer identity associated with the QoS flow;
- b) the EPS QoS parameters shall be set to the mapped EPS QoS parameters of the EPS bearer received in the mapped EPS bearer context, or the EPS QoS parameters associated with the QoS flow;
- c) the extended EPS QoS parameters shall be set to the mapped extended EPS QoS parameters of the EPS bearer received in the mapped EPS bearer context, or the extended EPS QoS parameters associated with the QoS flow; and
- d) the traffic flow template shall be set to the mapped traffic flow template of the EPS bearer received in the mapped EPS bearer context, or the stored traffic flow template associated with the QoS flow, if available.

After inter-system change from N1 mode to S1 mode, the UE shall associate the PDU session identity, the S-NSSAI, and the session-AMBR with the default EPS bearer context, and for each EPS bearer context mapped from one or more QoS flows, associate the QoS rule(s) for the QoS flow(s) and the QoS flow description(s) for the QoS flow(s) with the EPS bearer context.

After inter-system change from N1 mode to S1 mode, the UE and the SMF shall maintain the PDU session type of the PDU session until the PDN connection corresponding to the PDU session is released if the UE supports non-IP PDN type and the PDU session type is "Ethernet" or "Unstructured".

After inter-system change from N1 mode to S1 mode, the UE and the SMF shall maintain the always-on PDU session indication.

After inter-system change from N1 mode to S1 mode, the UE and the SMF shall maintain the maximum number of supported packet filters until the PDN connection corresponding to the PDU session is released.

[TS 38.331, clause 5.3.3.2]

Upon initiation of the procedure, the UE shall:

- 1> if the upper layers provide an Access Category and one or more Access Identities upon requesting establishment of an RRC connection:
  - 2> perform the unified access control procedure as specified in 5.3.14 using the Access Category and Access Identities provided by upper layers;
  - 3> if the access attempt is barred, the procedure ends;
- 1> apply the default L1 parameter values as specified in corresponding physical layer specifications except for the parameters for which values are provided in *SIB1*;
- 1> apply the default MAC Cell Group configuration as specified in 9.2.2;
- 1> apply the CCCH configuration as specified in 9.1.1.2;
- 1> apply the *timeAlignmentTimerCommon* included in *SIB1*;
- 1> start timer T300;
- 1> initiate transmission of the *RRCSetupRequest* message in accordance with 5.3.3.3;

[TS 38.331, clause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

- 1> set the *ue-Identity* as follows:
  - 2> if upper layers provide a 5G-S-TMSI:
    - 3> set the *ue-Identity* to *ng-5G-S-TMSI-Part1*;
  - 2> else:
    - 3> draw a 39-bit random value in the range  $0..2^{39}-1$  and set the *ue-Identity* to this value;

NOTE 1: Upper layers provide the *5G-S-TMSI* if the UE is registered in the TA of the current cell.

- 1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.3.6.

[TS 38.331, clause 5.3.8.3]

The UE shall:

- ...
- 1> if the *RRCRelease* message includes *redirectedCarrierInfo* indicating redirection to *eutra*:
  - 2> if *cnType* is included:
    - 3> after the cell selection, indicate the available CN Type(s) and the received *cnType* to upper layers;

NOTE 1: Handling the case if the E-UTRA cell selected after the redirection does not support the core network type specified by the *cnType*, is up to UE implementation.

- 2> if *voiceFallbackIndication* is included:
  - 3> consider the RRC connection release was for EPS fallback for IMS voice (see TS 23.502 [43]);
- 1> if the *RRCRelease* message includes the *cellReselectionPriorities*:
  - 2> store the cell reselection priority information provided by the *cellReselectionPriorities*;

[TS 38.331, clause 5.3.11]

The UE shall:

- ...
- 1> else:
  - 2> if T302 is running:
    - 3> stop timer T302;

- 3> perform the actions as specified in 5.3.14.4;[TS 36.304, clause 5.2.4.4]

For the highest ranked cell (including serving cell) according to cell reselection criteria specified in clause 5.2.4.6, for the best cell according to absolute priority reselection criteria specified in clause 5.2.4.5, the UE shall check if the access is restricted according to the rules in clause 5.3.1.

If that cell and other cells have to be excluded from the candidate list, as stated in clause 5.3.1, the UE shall not consider these as candidates for cell reselection. This limitation shall be removed when the highest ranked cell changes.

If the highest ranked cell or best cell according to absolute priority reselection rules is an intra-frequency or inter-frequency cell which is not suitable for a CN type due to being part of the "list of forbidden TAs for roaming" or belonging to a PLMN which is not indicated as being equivalent to the registered PLMN, the UE shall not consider this cell and other cells on the same frequency, as candidates for reselection for the CN type for a maximum of 300s. If the UE enters into state *any cell selection*, any limitation shall be removed. If the UE is redirected under E-UTRAN control to a frequency for which the timer is running, any limitation on that frequency shall be removed.

[TS 36.304, clause 5.3.11]

Cell status and cell reservations are indicated in the *SystemInformationBlockType1* message (or *SystemInformationBlockType1-BR* message or *SystemInformationBlockType1-NB* message) TS 36.331 [3] by means of the following fields:

- *cellBarred* (IE type: "barred" or "not barred")  
This field indicates if the cell is barred for connectivity to EPC.  
This field is ignored by the UEs supporting *crs-IntfMitig* while *crs-IntfMitigEnabled* is included in SIB1.  
This field is ignored by the BL UEs or UEs in CE supporting *ce-CRS-IntfMitig* while *crs-IntfMigitNumPRBs* is included in SIB1-BR.  
In case of multiple EPC PLMNs indicated in SIB1/SIB1-BR, this field is common for all EPC PLMNs

NOTE: For IAB node, it ignores the *cellBarred*, *cellReservedForOperatorUse* and *cellReservedForOtherUse* as defined in TS 36.331 [3].

...

The following description for handling of barred and reserved cells is per CN type. If the UE supports more than one CN type, the UE shall only exclude a cell as candidate for selection/reselection if it is excluded for both CN types.

NOTE: Fields *cellBarred-CRS* and *cellReservedForOperatorUse-CRS* are not indicated in *SystemInformationBlockType1-NB*

When cell status is indicated as "not barred" and "not reserved" for operator use,

- All UEs shall treat this cell as candidate during the cell selection and cell reselection procedures.

When cell status is indicated as "not barred" and "reserved" for operator use for any PLMN,

- UEs assigned to Access Class 11 or 15 operating in their HPLMN/EHPLMN shall treat this cell as candidate during the cell selection and reselection procedures if the field *cellReservedForOperatorUse* for that PLMN set to "reserved".
- UEs assigned to an Access Class in the range of 0 to 9, 12 to 14 shall behave as if the cell status is "barred" in case the cell is "reserved for operator use" for the registered PLMN or the selected PLMN.

NOTE: ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN; ACs 12, 13, 14 are only valid for use in the home country TS 22.011 [4].

When cell status "barred" is indicated or to be treated as if the cell status is "barred",

- The UE is not permitted to select/reselect this cell, not even for emergency calls.
- The UE shall consider other cells for cell selection/reselection according to the following rule:

11.1.4.3

Test Description

11.1.4.3.1

Pre-test conditions

System Simulator:

- NR Cell 1 is configured according to TS 38.508-1 [4] Table 4.4.2-3 and is connected to 5GC.
- E-UTRA Cell 1 and E-UTRA Cell 3 are configured to TS 36.508 [7] Table 4.4.2-2 and are connected to EPC.
- System information on the NR Cell 1 in accordance with combination NR-6 in TS 38.508-1 [4] sub-clause 4.4.3.1.2, and, for the E-UTRA Cell 1 and Cell 3 in accordance with combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.
- N26 interface is configured.
- Power levels are constant and as defined in Table 11.1.4.3.1-1.

Table 11.1.4.3.1-1: Cell power levels

	Parameter name	Unit	NR Cell 1	E-UTRA Cell 1	E-UTRA Cell 3
T0	SS/PBCH SSS EPRE	dBm/SCS	-88	-	-
	RS EPRE	dBm/15kHz	-	-97	-85

UE:

None.

Preamble:

- With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established.
- The UE is switched-off.
- With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR) with at least one Internet PDU session and one IMS PDU session on NR Cell 1, in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned.

11.1.4.3.2

Test procedure sequence

Table 11.1.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Set the power levels according to "T0" as per Table 11.1.4.3.1-1	-	-	-	-
-	The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
2	The SS transmits a <i>Paging</i> message.	<--	NR RRC: <i>Paging</i>	-	-
3	The UE transmits an <i>RRCSetupRequest</i> message.	-->	NR RRC: <i>RRCSetupRequest</i>	-	-
4-9	Steps 3 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are executed to successfully complete the service request procedure.	-	-	-	-
-	EXCEPTION: Steps 10a1 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation	-	-	-	-
10a1	IF pc_IP_Ping = TRUE, THEN Check: Does the test result of generic test procedure 1a1-1b2 in TS 38.508-1 [4] subclause 4.9.1 indicate that the UE is capable of exchanging IP data?	-	-	1	P
11	Make the UE attempt an IMS speech call.	-	-	-	-
12-16	Steps 1-5 of generic procedure "EPS Fallback for Voice Call / steps before fallback / 5GS" as defined in Appendix A.9.1 of TS 34.229-5 [41] take place.	-	-	-	-
17	The SS transmits an <i>RRCRelease</i> message	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The following messages are to be observed on E-UTRA Cell 1 unless explicitly stated otherwise.	-	-	-	-
18	Generic test procedure in TS 38.508-1 [4] Table 4.9.7.2.2-1 Steps 1-6 is performed without 'connected without release' on E-UTRAN cell upon mobility from NR.	-	-	-	-
19	The SS configures a new RLC-UM data radio bearer with condition DRB (0,1), associated with the dedicated EPS bearer context. <i>RRCConnectionReconfiguration</i> message contains the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message. EPS bearer context #4 (QCI 1) according to TS 36.508 [7] Table 6.6.2-1: Reference dedicated EPS bearer contexts. Reference dedicated EPS bearer contexts is to establish the dedicated EPS bearer context on IMS PDN.	<--	RRC: <i>RRCConnectionReconfiguration</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	-	-
-	EXCEPTION: In parallel to the events described in steps 20-22 below, the steps specified in table 11.1.4.3.2-2 will take place.	-	-	-	-
20	The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message.	-->	RRC: <i>RRCConnectionReconfigurationComplete</i>	-	-
21	The UE transmits an <i>ULInformationTransfer</i> message including the ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message.	-->	RRC: <i>ULInformationTransfer</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	-	-
22	The SS waits 1 second for call duration.	-	-	-	-
-	EXCEPTION: Steps 23a1 describe behaviour that depends on the UE	-	-	-	-



	implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation				
23a1	IF pc_IP_Ping = TRUE, THEN Check: Does the test result of generic test procedure 1a1-1b2 in TS 38.508-1 [4] subclause 4.9.1 indicate that the UE is capable of exchanging IP data?	-	-	1	P
24	Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.32.	-	-	-	-

Table 11.1.4.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
-	EXCEPTION: Steps 1a1 to 1b7 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that take place if a capability is supported	-	-	-	-
1a1-1a2	The UE performs IMS re-registration on EUTRAN as per steps 1-2 as defined in TS 34.229-1 [35] C.46.	-	-	-	-
1a3-1a6	Steps 1-4 of the generic procedure “EPS Fallback for Voice Call / steps after fallback / 5GS” as defined in Appendix A.9.2 of TS 34.229-5 [41] take place.	-	-	-	-
1a7	Check: Does the UE perform step 5 of the generic procedure “EPS Fallback for Voice Call / steps after fallback / 5GS” as defined in Appendix A.9.2 of TS 34.229-5 [41]	-->	SIP: ACK	1	P

11.1.4.3.3 Specific message contents

Table 11.1.4.3.3-1: REGISTRATION REQUEST (preamble, Table 11.1.4.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GMM capability			
S1 mode	'1'B	S1 mode supported	
S1 UE network capability	Present but contents not checked		

Table 11.1.4.3.3-2: REGISTRATION ACCEPT (preamble, Table 11.1.4.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS network feature support			
IMS- VoPS-3GPP	'1'B	IMS voice over PS session supported over 3GPP access	
IWK N26	'0'B	Interworking without N26 interface not supported	

Table 11.1.4.3.3-3: PDU SESSION ESTABLISHMENT ACCEPT (preamble for PDU Session for PS data, Table 11.1.4.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.2-2, condition Interworking_with_EPS
---

Table 11.1.4.3.3-4: PDU SESSION ESTABLISHMENT ACCEPT (preamble for IMS PDU Session, Table 11.1.4.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.7.2-2, condition Interworking_with_EPS, IMS_DNN_Requested
--

Table 11.1.4.3.3-5: *RRCSetupRequest* (step 3, Table 11.1.4.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.6.1-4H			
Information Element	Value/remark	Comment	Condition
RRCSetupRequest ::= SEQUENCE {			
rrcSetupRequest SEQUENCE {			
establishmentCause	mo-Data		
}			
}			

Table 11.1.4.3.3-6: RRCRelease message (step 17, table 11.1.4.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.6.1-16			
Information Element	Value/remark	Comment	Condition



**when** {User initiates a MMTEL call, the MO IMS voice session establishment has been initiated and the UE receives a RRCRelease message which includes redirectedCarrierInfo indicating redirection to eutra, and, a higher ranked E-UTRA cell is found with cell status "reserved for operator use" and a lower ranked E-UTRA cell is found which is not "reserved for operator use" both cells belonging to the UE's HPLMN}

**then** { UE selects the E-UTRA cell respecting the UE Access Class, performs an ATTACH or a TAU procedure, and, while the UE continues receiving and transmitting PS data the UE successfully completes the MO MMTEL call in EPS}

}

11.1.5.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS23.502, clauses 4.11.2.2, 4.13.6.1; TS 24.501, clause 6.1.4.2; TS 38.331, clause 5.3.11. Unless otherwise stated these are Rel-15 requirements.

[TS 23.502, clause 4.11.2.2]

The following procedure is used by UEs in single-registration or dual registration mode on mobility from 5GS to EPS.

In the case of network sharing the UE selects the target PLMN ID according to clause 5.18.3 of TS 23.501 [2].

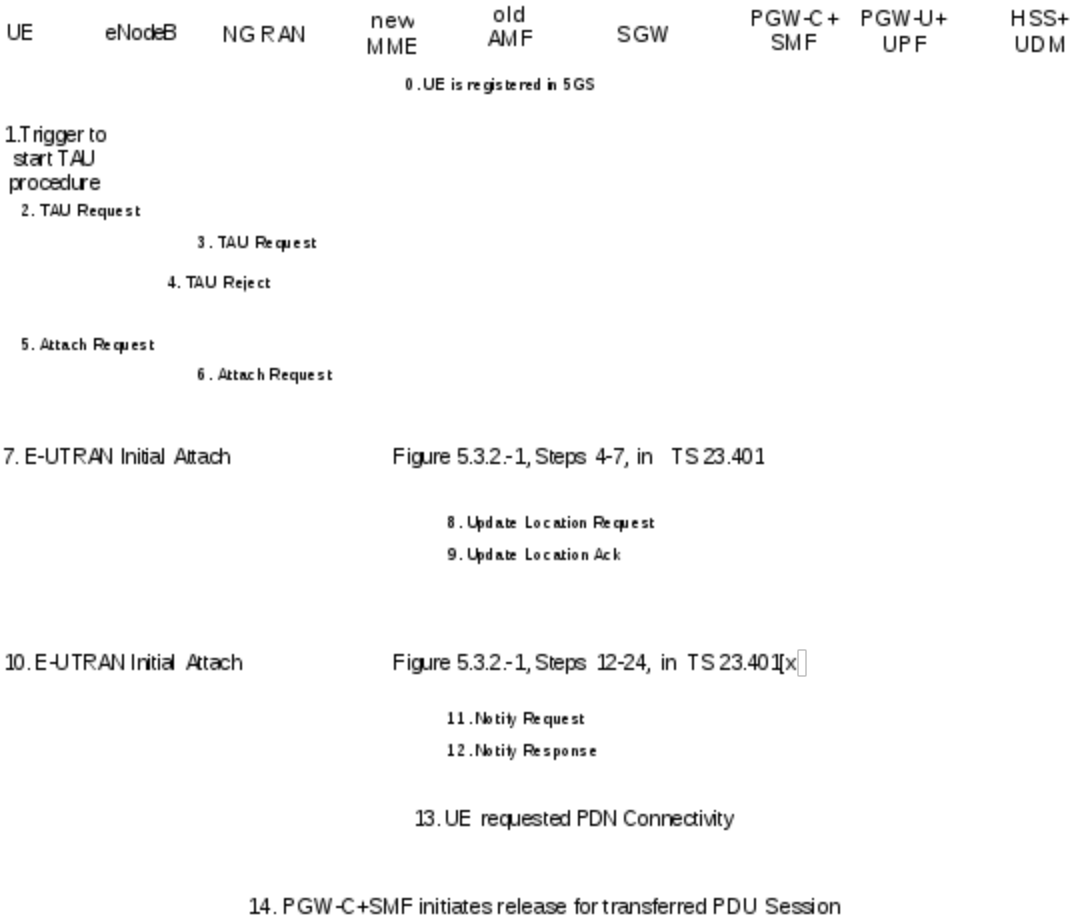


Figure 4.11.2.2-1: Mobility procedure from 5GS to EPS without N26 interface

The UE operating in single-registration mode can start the procedure from Step 1 or Step 5. The UE operating in dual-registration mode starts the procedure from Step 5.

NOTE 1: The network has indicated the " Interworking without N26" to the UE. To support IP address preservation, the UE in single-registration mode starts the procedure from Step 5. If the UE in single-registration mode starts the procedure from Step 1, the IP address preservation is not provided.

0. UE is registered in 5GS and established PDU sessions. The FQDN for the S5/S8 interface of the PGW-C+SMF is also stored in the UDM by the PGW-C+SMF during PDU Session setup in addition to what is specified in clause 4.3.2.2.1 and clause 4.3.2.2.2.

NOTE 2: At 5GS to EPS mobility, the MME use the FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF, and when UE moves back from EPS to 5GS, the AMF uses FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF.

1. Step 1 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].

2. Step 2 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13] with the following modifications:

The UE shall provide a EPS-GUTI that is mapped from the 5G-GUTI following the mapping rules specified in TS 23.501 [2]. The UE indicates that it is moving from 5GC.

3. Step 3 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].

4. If the MME determined that the old node is an AMF based on UE's GUTI mapped from 5G-GUTI and the MME is configured to support 5GS-EPS interworking without N26 procedure, the MME sends a TAU Reject to the UE.

5. Step 1 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13] with the modifications captured in clause 4.11.2.4.1.

6. Step 2 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].

7. Steps 4-7 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.

8. Step 8 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.

9. Step 11 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the following modifications:

The subscription profile the MME receives from HSS+UDM includes per DNN/APN at most one PGW-C+SMF FQDN as described in in clause 5.17.2.1 in TS 23.501 [2].

10. Steps 12-24 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications as described in clause 4.11.2.4.1.

11. Step 25 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].

12. Step 26 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].

13. If the UE has remaining PDU Sessions in 5GS which it wants to transfer to EPS and maintain the same IP address/prefix, the UE performs the UE requested PDN Connectivity Procedure as specified in TS 23.401 [13] clause 5.10.2 and sets the Request Type to "handover" in Step 1 of the procedure with modification captured in clause 4.11.2.4.2. UE provides an APN and the PDU Session ID corresponding to the PDU Session it wants to transfer to EPS. The UE provides the PDU Session ID in PCO as described in clause 4.11.1.1.

UEs in single-registration mode performs this step for each PDU Session immediately after completing the E-UTRAN Initial Attach procedure. UEs in dual-registration mode may perform this step any time after the completing of E-UTRAN Initial Attach procedure. Also, UEs in dual-registration mode may perform this step only for a subset of PDU Sessions.

The MME determines the PGW-C+SMF address for the Create Session Request based on the APN received from the UE and the subscription profile received from the HSS+UDM in Step 9 or when the HSS+UDM notifies the MME for the new PGW-C+SMF ID in the updated subscription profile.

The PGW-C+SMF uses the PDU Session ID to correlate the transferred PDN connection with the PDU Session in 5GC.

As a result of the procedure the PGW-U+UPF starts routing DL data packets to the Serving GW for the default and any dedicated EPS bearers established for this PDN connection.

14. The PGW-C+SMF initiates release of the PDU Session(s) in 5GS transferred to EPS as specified in clause 4.3.4.2 with the following clarification:

In step 2, the PGW-C+SMF shall not release IP address/prefix(es) allocated for the PDU Session.

If UP connection of the PDU Session is not active, step 3b is not executed, thus the steps triggered by step 3b are not executed;

If UP connection of the PDU Session is active, the SMF invokes the Namf\_Communication\_N1N2MessageTransfer service operation without including N1 SM container (PDU Session Release Command).

[TS 23.502, clause 4.13.6.1]

Figure 4.13.6.1-1 describes the EPS fallback procedure for IMS voice.

When the UE is served by the 5G System, the UE has one or more ongoing PDU Sessions each including one or more QoS Flows. The serving PLMN AMF has sent an indication towards the UE during the Registration procedure that IMS voice over PS session is supported, see clause 5.16.3.10 in TS 23.501 [2] and the UE has registered in the IMS. If N26 is not supported, the serving PLMN AMF sends an indication towards the UE during the Registration procedure that interworking without N26 is supported, see clause 5.17.2.3.1 in TS 23.501 [2].

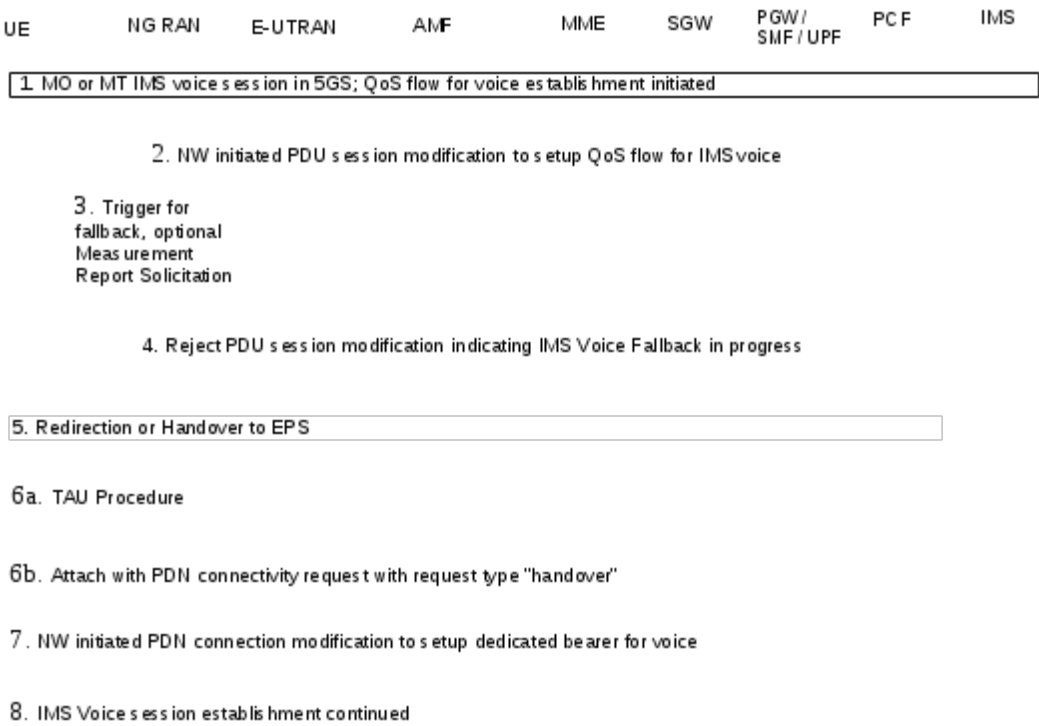


Figure 4.13.6.1-1: EPS Fallback for IMS voice

- 1. UE camps on NG-RAN in the 5GS and an MO or MT IMS voice session establishment has been initiated.
- 2. Network initiated PDU Session modification to setup QoS flow for voice reaches the NG-RAN (see N2 PDU Session Request in clause 4.3.3).
- 3. NG-RAN is configured to support EPS fallback for IMS voice and decides to trigger fallback to EPS, taking into account UE capabilities, indication from AMF that "Redirection for EPS fallback for voice is possible" (received as part of initial context setup as defined in TS 38.413 [10]), network configuration (e.g. N26 availability configuration) and radio conditions. If NG-RAN decides not to trigger fallback to EPS, then the procedure stops here and following steps are not executed.

NG-RAN may initiate measurement report solicitation from the UE including E-UTRAN as target.

NOTE 1: If AMF has indicated that "Redirection for EPS fallback for voice is not possible", then AN Release via inter-system redirection to EPS is not performed in step 5.

- 4. NG-RAN responds indicating rejection of the PDU Session modification to setup QoS flow for IMS voice received in step 2 by PDU Session Response message towards the PGW-C+SMF (or H-SMF+P-GW-C via V-SMF, in case of roaming scenario) via AMF with an indication that mobility due to fallback for IMS voice is ongoing. The PGW-C+SMF maintains the PCC rule(s) associated with the QoS Flow(s).
- 5. NG-RAN initiates either handover (see clause 4.11.1.2.1), or AN Release via inter-system redirection to EPS (see clause 4.2.6 and clause 4.11.1.3.2), taking into account UE capabilities. The PGW-C+SMF reports change of the RAT type if subscribed by PCF as specified in clause 4.11.1.2.1, or clause 4.11.1.3.2.6. When the UE is connected to EPS, either 6a or 6b is executed

6a. In the case of 5GS to EPS handover, see clause 4.11.1.2.1, and in the case of inter-system redirection to EPS with N26 interface, see clause 4.11.1.3.2. In either case the UE initiates TAU procedure; or

6b. In the case of inter-system redirection to EPS without N26 interface, see clause 4.11.2.2. If the UE supports Request Type flag "handover" for PDN connectivity request during the attach procedure as described in clause 5.3.2.1 of TS 23.401 [13] and has received the indication that interworking without N26 is supported, then the UE initiates Attach with PDN connectivity request with request type "handover".

In inter-system redirection, the UE uses the emergency indication in the RRC message as specified in clause 6.2.2 of TS 36.331 [16] and E-UTRAN provides the emergency indication to MME during Tracking Area Update or Attach procedure. For the handover procedure see clause 4.11.1.2.1, step 1.

7. After completion of the mobility procedure to EPS or as part of the 5GS to EPS handover procedure (see clause 4.11.1.2.1), the SMF/PGW re-initiates the setup of the dedicated bearer for IMS voice, mapping the 5G QoS to EPC QoS parameters. The PGW-C+SMF behaves as specified in clause 4.9.1.3.1. The PGW-C+SMF reports about Successful Resource Allocation and Access Network Information if subscribed by PCF.

8. The IMS voice session establishment is continued.

At least for the duration of the voice call in EPS the E-UTRAN is configured to not trigger any handover to 5GS.

[TS 24.501, clause 6.1.4.2]

When the network does not support N26 interface, the SMF does not provide the UE with the mapped EPS bearer context for a PDU session.

NOTE 1: Since the SMF does not provide the UE with the mapped EPS bearer context for a PDU session, the UE does not know whether interworking with EPS is supported for a PDU session before attempting to transfer the PDU session from N1 mode to S1 mode.

NOTE 2: It is up to UE implementation to decide which PDU session(s) to be attempted to transfer from N1 mode to S1 mode, e.g. based on UE policy or user preference.

Upon inter-system change from N1 mode to S1 mode in EMM-IDLE mode, the UE shall use the parameters from each PDU session which the UE intends to transfer to EPS to create the contents of a PDN CONNECTIVITY REQUEST message as follows:

- a) if the PDU session is an emergency PDU session, the request type shall be set to "handover of emergency bearer services". Otherwise the request type shall be set to "handover";
- b) the PDU session type of the PDU session shall be mapped to the PDN type of the default EPS bearer context as follows:
  - 1) the PDN type shall be set to "non-IP" if the PDU session type is "Ethernet" or "Unstructured";
  - 2) the PDN type shall be set to "IPv4" if the PDU session type is "IPv4";
  - 3) the PDN type shall be set to "IPv6" if the PDU session type is "IPv6"; and
  - 4) the PDN type shall be set to "IPv4v6" if the PDU session type is "IPv4v6";
- c) the DNN of the PDU session shall be mapped to the APN of the default EPS bearer context; and
- d) the PDU session ID parameter in the PCO IE shall be set to the PDU session identity of the PDU session.

After inter-system change from N1 mode to S1 mode, the UE shall associate the PDU session identity with the default EPS bearer context.

Upon successful completion of an EPS attach procedure after inter-system change from N1 mode to S1 mode (see 3GPP TS 24.301 [15]), the UE shall delete any UE derived QoS rules.



The UE shall locally release the PDU session(s) and QoS flow(s) associated with the 3GPP access which have not been transferred to EPS.

...

[TS 38.331, clause 5.3.11]

UE shall:

- 1> reset MAC;
- 1> if T302 is running:
  - 2> stop timer T302;
  - 2> perform the actions as specified in 5.3.14.4;
- 1> stop all timers that are running except T320 and T325;
- 1> discard the UE Inactive AS context;
- 1> set the variable *pendingRnaUpdate* to *false*, if that is set to *true*;
- 1> discard the K<sub>gNB</sub>, the K<sub>RRCEnc</sub> key, the K<sub>RRCint</sub>, the K<sub>UPint</sub> key and the K<sub>UPenc</sub> key, if any;
- 1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity and SDAP for all established RBs;
- 1> indicate the release of the RRC connection to upper layers together with the release cause;
- 1> enter RRC\_IDLE and perform cell selection as specified in TS 38.304 [20], except if going to RRC\_IDLE was triggered by selecting an inter-RAT cell while T311 was running;
- 1> if going to RRC\_IDLE was triggered by reception of the *RRCRelease* message including a *waitTime*:
  - 2> start timer T302 with the value set to the *waitTime*;
  - 2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2'.

**11.1.5.3                    Test description**

**11.1.5.3.1                Pre-test conditions**

**System Simulator:**

- 3 cells
- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2.
- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], sub-clause 4.4.3.1.1.
- E-UTRA Cell 2 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 1 as defined in TS 36.508 [7], sub-clause 4.4.3.1.1. Cell 2 is set as "reserved for operator use" in SIB1.

**UE:**

- The UE fitted with a USIM with access class 0..9

Preamble:

- With E-UTRA Cell 1 "Serving cell", E-UTRA Cell 2 "Non-suitable "Off" cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established.
- The UE is switched-off.
- With E-UTRA Cell 1 "Non-suitable "Off" cell", E-UTRA Cell 2 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), with one Internet PDU session and one IMS PDU session on NR Cell 1, in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned.

11.1.5.3.2 Test procedure sequence

Table 11.1.5.3.2-0 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" is applied at the point indicated in the Main behaviour description in Table 11.1.5.3.2-1.

Table 11.1.5.3.2-0: Time instances of cell power level and parameter changes

	Parameter	Unit	E-UTRA Cell 1	E-UTRA Cell 2	Remark
T1	Cell-specific RS EPRE	dBm/15kHz	-85	-73	The power level values are assigned to satisfy $R_{Cell\ 1} < R_{Cell\ 2}$ .

Table 11.1.5.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		

0	SS adjusts cell power levels of EUTRA Cell 1 and EUTRA Cell 2 according to row T1 of Table 11.1.5.3.2-0.	-	-	-	-
-	EXCEPTION: The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
1	The SS transmits a <i>Paging</i> message.	<--	NR RRC: <i>Paging</i>	-	-
2	The UE transmits an <i>RRCSetupRequest</i> message.	-->	NR RRC: <i>RRCSetupRequest</i>	-	-
3-9a2	Steps 3 to 9a2 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are executed to successfully complete the service request procedure.	-	-	-	-
10	Make the UE attempt an MTSI MO Speech Call.	-	-	-	-
11	The UE transmits an INVITE message.	-	-	-	-
12	Void	-	-	-	-
-	EXCEPTION: Steps 12a1 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation.	-	-	-	-
12a1	IF pc_IP_Ping = TRUE, THEN Check: Does the test result of generic test procedure 1a1-1b2 in TS 38.508-1 [4] subclause 4.9.1 indicate that the UE is capable of exchanging IP data on DRB associated with the internet PDN?	-		1	P
13	The SS transmits an <i>RRCRelease</i> message.	<--	NR RRC: <i>RRCRelease</i>	-	-
-	EXCEPTION: The following messages are to be observed on E-UTRA Cell 1 unless explicitly stated otherwise.	-	-	-	-
14	Check: Does the UE send an <i>RRCCConnectionRequest</i> message on E-UTRA cell 1?	-->	RRC: <i>RRCCConnectionRequest</i>	1	P
15	SS transmits an <i>RRCCConnectionSetup</i> message.	<--	RRC: <i>RRCCConnectionSetup</i>	-	-
-	EXCEPTION: Steps 15a1 to 15b3 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation.	-	-	-	-
15a1	If the UE tries to preserve the IP address of the PDN connection then check does the UE transmits an ATTACH REQUEST message?	-->	RRC: <i>RRCCConnectionSetupComplete</i> NAS: ATTACH REQUEST	1	P
15b1	Else check: does the UE transmit a TRACKING AREA UPDATE REQUEST message?	-->	RRC: <i>RRCCConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST	1	P
15b2	The SS transmits a TRACKING AREA UPDATE REJECT message to UE.	<--	RRC: <i>DLInformationTransfer</i> NAS: TRACKING AREA UPDATE REQUEST REJECT	-	-
15b3	The UE transmits an ATTACH REQUEST message.	-->	RRC: <i>ULInformationTransfer</i> NAS: ATTACH REQUEST	-	-
16-27	Steps 5 to 16 of the generic test procedure for UE registration (TS 36.508 [2] Table 4.5.2.3-1).	-	-	-	-
-	EXCEPTION: In parallel to the events described in steps 27a1 to 36 the steps specified in Table 11.1.5.3.2-2 will take place to transfer internet PDU session to EPS.	-	-	-	-
-	EXCEPTION: In parallel to the events	-	-	-	-

	described in steps 28 to 37 the UE may perform IMS re-registration on EUTRAN as per steps 3-11 as defined in 34.229-1 [35] subclause C.46 using the message "REGISTER" with condition A31.				
28-32	Steps 9a1-13 from the Generic Test Procedure for MTSI MO speech call establishment (TS 36.508 [2] table 4.5A.6.3-1) are performed.	-	-	-	-
33-34	Void	-	-	-	-
35	Check: Does the UE transmit an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message?	-->	RRC: <i>ULInformationTransfer</i> NAS:ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	1	P
36	The SS waits 1 second.	-	-	-	-
-	EXCEPTION: Steps 36a1 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation	-	-	-	-
36a1	IF pc_IP_Ping = TRUE, THEN Check: Does the test result of generic test procedure 1a1-1b2 in TS 38.508-1 [4] subclause 4.9.1 indicate that the UE is capable of exchanging IP data on DRB associated with the internet PDN?	-	-	1	P
37	Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.32.	-	-	-	-

Table 11.1.5.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE transmit a PDN CONNECTIVITY REQUEST message to request an additional PDN.	-->	RRC: <i>ULInformationTransfer</i> NAS: PDN CONNECTIVITY REQUEST	1	P
2	The SS configures a new data radio bearer, associated with the additional default EPS bearer context. <i>RRCConnectionReconfiguration</i> message contains the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message.	<--	RRC: <i>RRCConnectionReconfiguration</i> NAS: ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST		
3	The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message to confirm the establishment of additional default bearer.	-->	RRC: <i>RRCConnectionReconfigurationComplete</i>		
-	EXCEPTION: In parallel to the event described in step 4 below, if initiated by the UE the generic procedure for IP address allocation in the U-plane specified in TS 36.508 subclause 4.5A.1 takes place performing IP address allocation in the U-plane.	-	-		
4	The UE transmits an ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message.	-->	RRC: <i>ULInformationTransfer</i> NAS: ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT		

11.1.5.3.3

Specific message contents

Table 11.1.5.3.3-0: REGISTRATION ACCEPT (preamble; step 14, TS 38.508-1 [4], Table 4.5.2.2-2)

Derivation path: TS 38.508-1 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
Extended protocol discriminator	'0111 1110'B	5GS mobility management messages	
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
5GS network feature support	'0100 0001 0000 0000'B	Interworking without N26 interface supported	

Table 11.1.5.3.3-1: RRCRelease (step 13, table 11.1.5.3.2-1)

Derivation path: TS 38.508-1 [4] Table Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition
RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
redirectedCarrierInfo CHOICE {			
eutra SEQUENCE {			
eutraFrequency	Downlink EARFCN of cell 1		
cnType	epc		
}			
}			
}			
}			
}			
}			

Table 11.1.5.3.3-2: ATTACH REQUEST (step 15a1, table 11.1.5.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4			
Information Element	Value/Remark	Comment	Condition

NAS key set identifier	$KSI_{ASME}$ that was created when the UE last registered to EPC E-UTRA		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI.		
Old GUTI type	"Native GUTI"		
ESM message container	PDN CONNECTIVITY REQUEST message to active PDU sessions which the UE intends to transfer to EPS.		

Table 11.1.5.3.3-3: PDN CONNECTIVITY REQUEST (Table 11.1.5.3.3-2)

Derivation Path: TS 36.508 [7], Table 4.7.3-20			
Information Element	Value/remark	Comment	Condition
EPS bearer identity	0	No EPS bearer identity assigned, <a href="#">for coding see Table 9.11.4.8.1 in TS 24.501 [22]</a>	
Procedure transaction identity	Any value from 1 to 254		
PDN connectivity request message identity	'1101 0000'B	PDN connectivity request	
Request type	'010'B	Handover	
PDN type	Any value between '001'B, '010'B, '011'B and '100'B	The allowed values are respectively IPv4, IPv6, IPv4v6 and "unused but interpreted as IPv6 by the network"	
Protocol configuration options	PDU session ID of IMS PDU session		

Table 11.1.5.3.3-4: TRACKING AREA UPDATE REQUEST (step 15b1, table 11.1.5.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-27, condition NR.			
Information Element	Value/Remark	Comment	Condition

"Active" flag	0001	Bearer Establishment requested	
EPS bearer context status	Present	EBI corresponding to active PDU Sessions need to be set to 1	
NAS key set identifier	KSI <sub>ASME</sub> that was created when the UE last registered to EPC E-UTRA		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI.		
Old GUTI type	"Native GUTI"		
UE status	"UE is in 5GMM-REGISTERED state"		

Table 11.1.5.3.3-5: TRACKING AREA UPDATE REJECT (step 15b2, table 11.1.5.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-26.			
Information Element	Value/Remark	Comment	Condition
EMM cause	'0000 1001'B	#9 "UE identity cannot be derived by the network"	

Table 11.1.5.3.3-6: ATTACH REQUEST (step 15b3, table 11.1.5.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4.			
Information Element	Value/Remark	Comment	Condition
IMSI	IMSI of the UE		

Table 11.1.5.3.3-7: PDN CONNECTIVITY REQUEST (step 1, table 11.1.5.3.2-2)

Derivation Path: TS 36.508 [7], Table 4.7.3-20			
Information Element	Value/remark	Comment	Condition

EPS bearer identity	0	No EPS bearer identity assigned, for coding see Table 9.11.4.8.1 in TS 24.501 [22]	
Procedure transaction identity	Any value from 1 to 254		
PDN connectivity request message identity	'1101 0000'B	PDN connectivity request	
Request type	'010'B	Handover	
PDN type	Any value between '001'B, '010'B, '011'B and '100'B	The allowed values are respectively IPv4, IPv6, IPv4v6 and "unused but interpreted as IPv6 by the network"	
Protocol configuration options	PDU session ID of internet PDU session		

11.1.6 MT MMTEL voice call setup from NR RRC\_IDLE / EPS Fallback with redirection / Single registration mode without N26 interface / Success

11.1.6.1 Test Purpose (TP)

(1)

with {UE supporting both S1 mode and N1 mode and operating in single-registration mode, and, the Network has indicated "interworking without N26 interface supported", and, the UE is in NR RRC\_IDLE state}

ensure that {

when { UE receives a *Paging* message with MT MMTEL voice call, the MT IMS voice session establishment has been initiated and the UE receives a RRCRelease message which includes redirectedCarrierInfo indicating redirection to eutra }

then {{the UE selects the E-UTRA cell, performs an ATTACH or a TAU procedure, and, successfully completes the MT MMTEL call setup in EPS }

}

11.1.6.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS23.502, clauses 4.11.2.2, 4.13.6.1; TS 24.501, clauses 4.5.4.1, 4.8.2.3; TS 38.331, clause 5.3.11. Unless otherwise stated these are Rel-15 requirements.

[TS 23.502, clause 4.11.2.2]

The following procedure is used by UEs in single-registration or dual registration mode on mobility from 5GS to EPS.

In the case of network sharing the UE selects the target PLMN ID according to clause 5.18.3 of TS 23.501 [2].



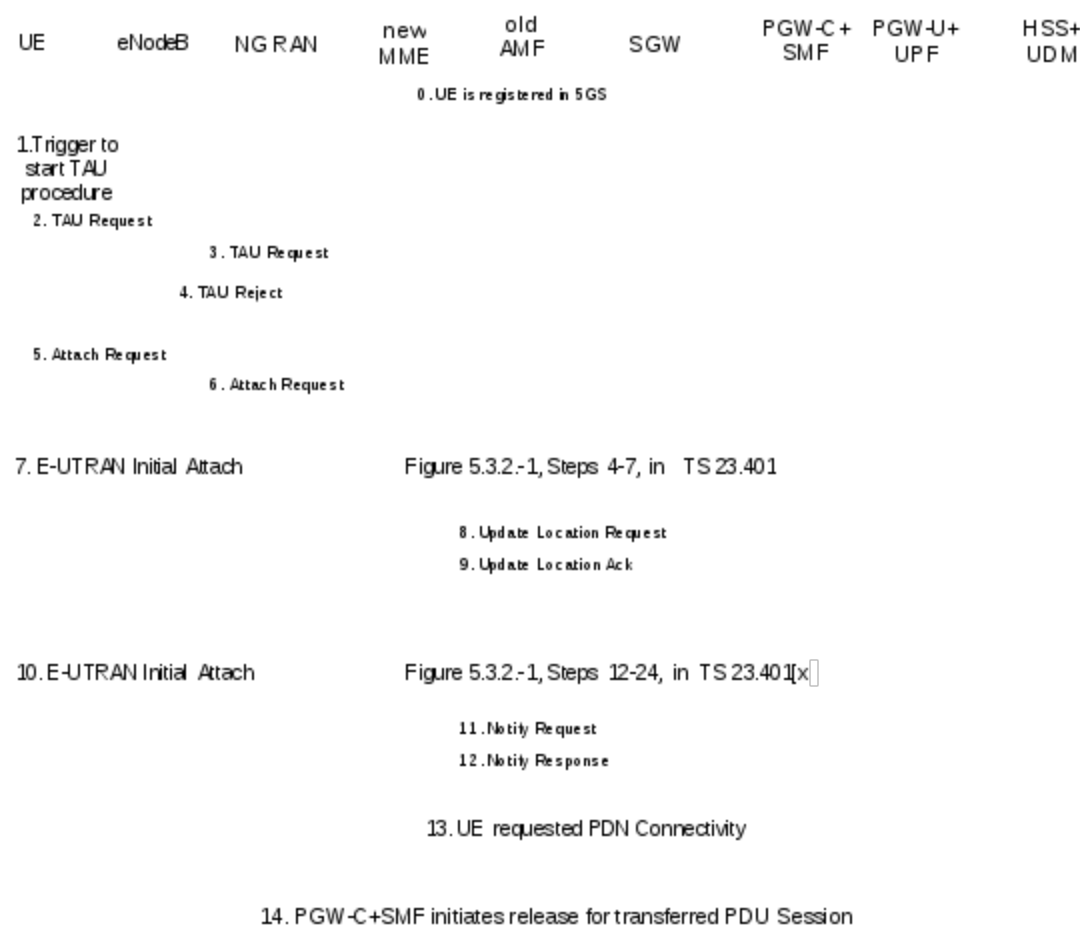


Figure 4.11.2.2-1: Mobility procedure from 5GS to EPS without N26 interface

The UE operating in single-registration mode can start the procedure from Step 1 or Step 5. The UE operating in dual-registration mode starts the procedure from Step 5.

NOTE 1: The network has indicated the "Interworking without N26" to the UE. To support IP address preservation, the UE in single-registration mode starts the procedure from Step 5. If the UE in single-registration mode starts the procedure from Step 1, the IP address preservation is not provided.

0. UE is registered in 5GS and established PDU sessions. The FQDN for the S5/S8 interface of the PGW-C+SMF is also stored in the UDM by the PGW-C+SMF during PDU Session setup in addition to what is specified in clause 4.3.2.2.1 and clause 4.3.2.2.2.

NOTE 2: At 5GS to EPS mobility, the MME use the FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF, and when UE moves back from EPS to 5GS, the AMF uses FQDN for the S5/S8 interface of the PGW-C+SMF to find the PGW-C+SMF.

1. Step 1 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].
2. Step 2 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13] with the following modifications:

The UE shall provide a EPS-GUTI that is mapped from the 5G-GUTI following the mapping rules specified in TS 23.501 [2]. The UE indicates that it is moving from 5GC.

3. Step 3 as in clause 5.3.3.1 (Tracking Area Update) in TS 23.401 [13].
4. If the MME determined that the old node is an AMF based on UE's GUTI mapped from 5G-GUTI and the MME is configured to support 5GS-EPS interworking without N26 procedure, the MME sends a TAU Reject to the UE.
5. Step 1 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13] with the modifications captured in clause 4.11.2.4.1.
6. Step 2 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].
7. Steps 4-7 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.
8. Step 8 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications captured in clause 4.11.2.4.1.
9. Step 11 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the following modifications:

The subscription profile the MME receives from HSS+UDM includes per DNN/APN at most one PGW-C+SMF FQDN as described in in clause 5.17.2.1 in TS 23.501 [2].
10. Steps 12-24 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13], with the modifications as described in clause 4.11.2.4.1.
11. Step 25 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].
12. Step 26 as in clause 5.3.2.1 (E-UTRAN Initial Attach) in TS 23.401 [13].
13. If the UE has remaining PDU Sessions in 5GS which it wants to transfer to EPS and maintain the same IP address/prefix, the UE performs the UE requested PDN Connectivity Procedure as specified in TS 23.401 [13] clause 5.10.2 and sets the Request Type to "handover" in Step 1 of the procedure with modification captured in clause 4.11.2.4.2. UE provides an APN and the PDU Session ID corresponding to the PDU Session it wants to transfer to EPS. The UE provides the PDU Session ID in PCO as described in clause 4.11.1.1.

UEs in single-registration mode performs this step for each PDU Session immediately after completing the E-UTRAN Initial Attach procedure. UEs in dual-registration mode may perform this step any time after the completing of E-UTRAN Initial Attach procedure. Also, UEs in dual-registration mode may perform this step only for a subset of PDU Sessions.

The MME determines the PGW-C+SMF address for the Create Session Request based on the APN received from the UE and the subscription profile received from the HSS+UDM in Step 9 or when the HSS+UDM notifies the MME for the new PGW-C+SMF ID in the updated subscription profile.

The PGW-C+SMF uses the PDU Session ID to correlate the transferred PDN connection with the PDU Session in 5GC.

As a result of the procedure the PGW-U+UPF starts routing DL data packets to the Serving GW for the default and any dedicated EPS bearers established for this PDN connection.
14. The PGW-C+SMF initiates release of the PDU Session(s) in 5GS transferred to EPS as specified in clause 4.3.4.2 with the following clarification:

In step 2, the PGW-C+SMF shall not release IP address/prefix(es) allocated for the PDU Session.

If UP connection of the PDU Session is not active, step 3b is not executed, thus the steps triggered by step 3b are not executed;

If UP connection of the PDU Session is active, the SMF invokes the Namf\_Communication\_N1N2MessageTransfer service operation without including N1 SM container (PDU Session Release Command).

[TS 23.502, clause 4.13.6.1]

Figure 4.13.6.1-1 describes the EPS fallback procedure for IMS voice.

When the UE is served by the 5G System, the UE has one or more ongoing PDU Sessions each including one or more QoS Flows. The serving PLMN AMF has sent an indication towards the UE during the Registration procedure that IMS voice over PS session is supported, see clause 5.16.3.10 in TS 23.501 [2] and the UE has registered in the IMS. If N26 is not supported, the serving PLMN AMF sends an indication towards the UE during the Registration procedure that interworking without N26 is supported, see clause 5.17.2.3.1 in TS 23.501 [2].

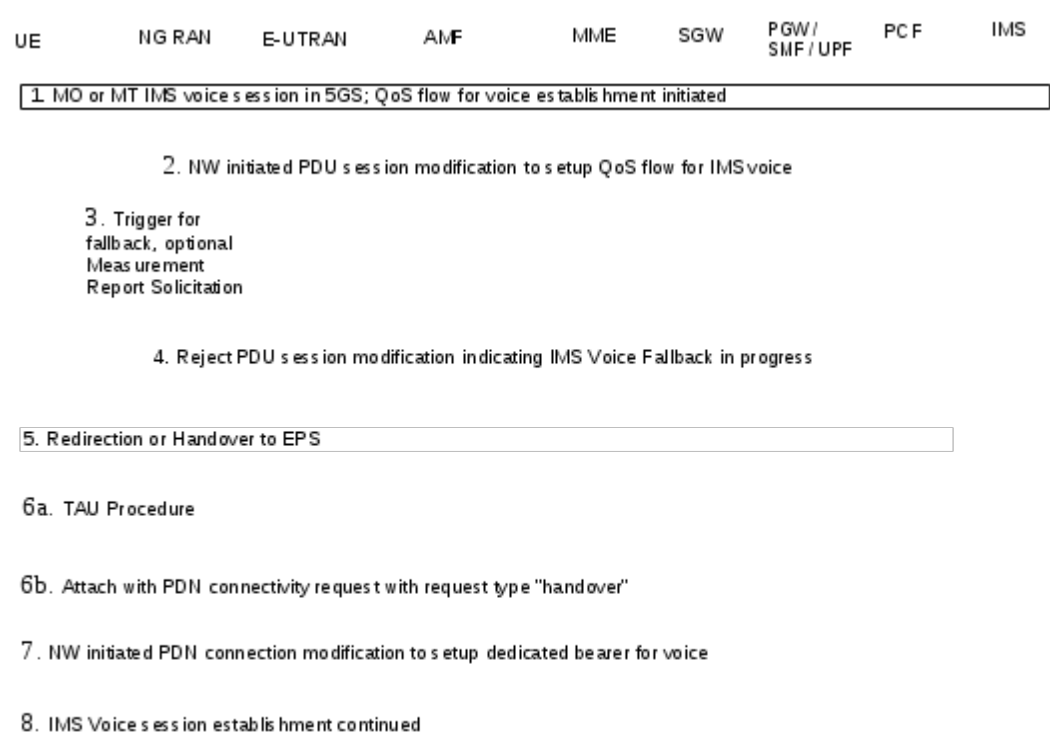


Figure 4.13.6.1-1: EPS Fallback for IMS voice

1. UE camps on NG-RAN in the 5GS and an MO or MT IMS voice session establishment has been initiated.
2. Network initiated PDU Session modification to setup QoS flow for voice reaches the NG-RAN (see N2 PDU Session Request in clause 4.3.3).
3. NG-RAN is configured to support EPS fallback for IMS voice and decides to trigger fallback to EPS, taking into account UE capabilities, indication from AMF that "Redirection for EPS fallback for voice is possible" (received as part of initial context setup as defined in TS 38.413 [10]), network configuration (e.g. N26 availability configuration) and radio conditions. If NG-RAN decides not to trigger fallback to EPS, then the procedure stops here and following steps are not executed.

NG-RAN may initiate measurement report solicitation from the UE including E-UTRAN as target.

NOTE 1: If AMF has indicated that "Redirection for EPS fallback for voice is not possible", then AN Release via inter-system redirection to EPS is not performed in step 5.

4. NG-RAN responds indicating rejection of the PDU Session modification to setup QoS flow for IMS voice received in step 2 by PDU Session Response message towards the PGW-C+SMF (or H-SMF+P-GW-C via V-SMF, in case of roaming scenario) via AMF with an indication that mobility due to fallback for IMS voice is ongoing. The PGW-C+SMF maintains the PCC rule(s) associated with the QoS Flow(s).
5. NG-RAN initiates either handover (see clause 4.11.1.6.1), or AN Release via inter-system redirection to EPS (see clause 4.2.6 and clause 4.11.1.3.2), taking into account UE capabilities. The PGW-C+SMF reports change of the RAT type if subscribed by PCF as specified in clause 4.11.1.6.1, or clause 4.11.1.3.2.6. When the UE is connected to EPS, either 6a or 6b is executed
  - 6a. In the case of 5GS to EPS handover, see clause 4.11.1.6.1, and in the case of inter-system redirection to EPS with N26 interface, see clause 4.11.1.3.2. In either case the UE initiates TAU procedure; or
  - 6b. In the case of inter-system redirection to EPS without N26 interface, see clause 4.11.2.2. If the UE supports Request Type flag "handover" for PDN connectivity request during the attach procedure as described in clause 5.3.2.1 of TS 23.401 [13] and has received the indication that interworking without N26 is supported, then the UE initiates Attach with PDN connectivity request with request type "handover".

In inter-system redirection, the UE uses the emergency indication in the RRC message as specified in clause 6.2.2 of TS 36.331 [16] and E-UTRAN provides the emergency indication to MME during Tracking Area Update or Attach procedure. For the handover procedure see clause 4.11.1.6.1, step 1.

7. After completion of the mobility procedure to EPS or as part of the 5GS to EPS handover procedure (see clause 4.11.1.6.1), the SMF/PGW re-initiates the setup of the dedicated bearer for IMS voice, mapping the 5G QoS to EPC QoS parameters. The PGW-C+SMF behaves as specified in clause 4.9.1.3.1. The PGW-C+SMF reports about Successful Resource Allocation and Access Network Information if subscribed by PCF.
8. The IMS voice session establishment is continued.

At least for the duration of the voice call in EPS the E-UTRAN is configured to not trigger any handover to 5GS.

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.8.2.3]

At inter-system change from N1 mode to S1 mode in EMM-IDLE mode when: ( PDU SEESION ACTIVE )

- a) the UE supports non-IP PDN type and at least one PDU session is active; or
- b) the UE does not support non-IP PDN type and at least one PDU session of IPv4, IPv6 or IPv4v6 PDU session type is active,

the UE shall proceed as follows:

- a) if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode and the UE has received an "interworking without N26 interface supported" indication from the network, the UE shall:
  - 1) enter substates EMM-DEREGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE;
  - 2) map the PDU session(s) which the UE intends to transfer to EPS to the default EPS bearer context of the corresponding PDN connection(s) as specified in subclause 6.1.4.2; and

- 3) initiate an EPS attach procedure and include a PDN CONNECTIVITY REQUEST message with request type set to "handover" in the ATTACH REQUEST message to activate a default EPS bearer context for one of the active PDU sessions which the UE intends to transfer to EPS.

After successful completion of the EPS attach procedure, the UE shall reset the registration attempt counter and the attach attempt counter (see 3GPP TS 24.301 [15]) and attempt to activate each of the other default EPS bearer contexts, if any, by initiating a stand-alone PDN connectivity procedure with request type set to "handover" in the PDN CONNECTIVITY REQUEST message; and

- b) otherwise, enter substates EMM-REGISTERED.NORMAL-SERVICE and 5GMM-REGISTERED.NO-CELL-AVAILABLE and initiate a tracking area update procedure (see 3GPP TS 24.301 [15]).

At inter-system change from N1 mode to S1 mode in EMM-IDLE mode when: ( NO PDU SESSION )

- a) the UE supports non-IP PDN type and no PDU session is active; or
- b) the UE does not support non-IP PDN type and no PDU session of IPv4, IPv6 or IPv4v6 PDU session type is active,

the UE shall enter substates EMM-DEREGISTERED.NORMAL-SERVICE and 5GMM-DEREGISTERED.NO-CELL-AVAILABLE, and initiate an attach procedure.

At inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, the UE shall:

- a) enter substate 5GMM-REGISTERED.NORMAL-SERVICE and substate EMM-REGISTERED.NO-CELL-AVAILABLE;
- b) map the default EPS bearer context(s) of the PDN connection(s) which the UE intends to transfer to 5GS, if any, to the corresponding PDU session(s) as specified in subclause 6.1.4.2; and
- c) initiate the registration procedure for mobility and periodic registration update indicating "mobility registration updating" in the 5GS registration type IE of the REGISTRATION REQUEST message (see subclause 5.5.1.3).

After having successfully registered in N1 mode the UE shall reset the registration attempt counter and the attach attempt counter (see 3GPP TS 24.301 [15]) and:

- a) if the UE supports the PDU session establishment procedure with request type set to "existing PDU session" to transfer a PDN connection from S1 mode to N1 mode and the UE has received an "interworking without N26 interface supported" indication from the network, attempt to transfer the PDN connection(s) which the UE intends to transfer to 5GS, if any, from S1 mode to N1 mode by initiating the PDU session establishment procedure with request type set to "existing PDU session"; and
- b) otherwise, establish PDU session(s) corresponding to the PDN connection(s) which the UE intends to transfer to 5GS, if any, by initiating the PDU session establishment procedure with request type set to "initial request".

See subclause 5.1.4.3 for coordination between 5GMM and EMM and subclause 6.1.4.2 for coordination between 5GSM and ESM.

[TS 38.331, clause 5.3.11]

UE shall:

- 1> reset MAC;
- 1> if T302 is running:
  - 2> stop timer T302;
  - 2> perform the actions as specified in 5.3.14.4;

- 1> stop all timers that are running except T320 and T325;

1> discard the UE Inactive AS context;

1> set the variable *pendingRnaUpdate* to *false*, if that is set to *true*;

1> discard the  $K_{gNB}$ , the  $K_{RRCenc}$  key, the  $K_{RRCint}$ , the  $K_{UPint}$  key and the  $K_{UPenc}$  key, if any;

1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity and SDAP for all established RBs;

1> indicate the release of the RRC connection to upper layers together with the release cause;

1> enter RRC\_IDLE and perform cell selection as specified in TS 38.304 [20], except if going to RRC\_IDLE was triggered by selecting an inter-RAT cell while T311 was running;

1> if going to RRC\_IDLE was triggered by reception of the *RRCRelease* message including a *waitTime*:

2> start timer T302 with the value set to the *waitTime*;

2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2'.

11.1.6.3

Test description

11.1.6.3.1

Pre-test conditions

System Simulator:

- 2 cells

- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], sub-clause 4.4.3.1.2.

- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], sub-clause 4.4.3.1.1.

UE:

None.

Preamble:

- With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established.

- The UE is switched-off.

- With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], with one IMS PDU session on NR Cell 1, Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

11.1.6.3.2 Test procedure sequence

Table 11.1.6.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U – S	Message		
1	The SS configures: - E-UTRA Cell 1 as "Suitable neighbour intra-frequency cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3.	-	-	-	-
-	EXCEPTION: Unless otherwise stated the following messages are exchange on NR Cell 1.	-	-	-	-
2	The SS transmits a <i>Paging</i> message.	<--	NR RRC: <i>Paging</i>	-	-
3	The UE transmits an <i>RRCSetupRequest</i> message.	-->	NR RRC: <i>RRCSetupRequest</i>	-	-
4	The SS transmits an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>	-	-
5	The UE transmits an <i>RRCSetupComplete</i> message and a SERVICE REQUEST message.	-->	NR RRC: <i>RRCSetupComplete</i> 5GMM: <i>SERVICE REQUEST</i>	-	-
6	The SS transmits an <i>RRCRelease</i> message.	<--	NR RRC: <i>RRCRelease</i>	-	-
-	EXCEPTION: The following message was sent on E-UTRA Cell 1.	-	-	-	-
7	UE transmits an <i>RRCCConnectionRequest</i> message.	-->	RRC: <i>RRCCConnectionRequest</i>	-	-
8	SS transmits an <i>RRCCConnectionSetup</i> message.	<--	RRC: <i>RRCCConnectionSetup</i>	-	-
-	EXCEPTION: Steps 8a1 to 8b3 describe behaviour that depends on the UE implementation; the "lower case letter" identifies a step sequence that take place depending on the UE implementation.	-	-	-	-
8a1	If the UE tries to preserve the IP address of the PDN connection then check does the UE transmits an ATTACH REQUEST message?	-->	RRC: <i>RRCCConnectionSetupComplete</i> NAS: <i>ATTACH REQUEST</i>	1	P
8b1	Else check: does the UE transmit a TRACKING AREA UPDATE REQUEST message?	-->	RRC: <i>RRCCConnectionSetupComplete</i> NAS: <i>TRACKING AREA UPDATE REQUEST</i>	1	P
8b2	The SS transmits a TRACKING AREA UPDATE REJECT message to UE.	<--	RRC: <i>DLInformationTransfer</i> NAS: <i>TRACKING AREA UPDATE REQUEST REJECT</i>	-	-
8b3	The UE transmits an ATTACH REQUEST message.	-->	RRC: <i>ULInformationTransfer</i> NAS: <i>ATTACH REQUEST</i>	-	-
9-20	Steps 5 to 16 of the generic test procedure for UE registration (TS 36.508 [7] Table 4.5.2.3-1).	-	-	-	-



-	EXCEPTION: In parallel to the events described in steps 21 to 29 the UE may perform IMS re-registration on EUTRAN as per steps as defined in defined in 34.229-1 [35] subclause C.46 using the message "REGISTER" with condition A31. 34.229-1 [35] subclause C.46.	-	-	-	-
21-28	Steps 7-14 from the Generic Test Procedure for MTSI MT speech call establishment (TS 36.508 [7] table 4.5A.7.3-1) are performed.	-	-	-	-
29	Check: Does the UE transmit an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message?	-->	RRC: ULInformationTransfer NAS:ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	1	P
30-40	Steps 16-26 from the Generic Test Procedure for MTSI MT speech call establishment (TS 36.508 [7] table 4.5A.7.3-1) are performed.	-	-	-	-
41	The SS waits 1 second.	-	-	-	-
42	Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.33.	-	-	-	-

11.1.6.3.3 Specific message contents

Table 11.1.6.3.3-0: REGISTRATION ACCEPT (preamble; step 14, TS 38.508-1 [4], Table 4.5.2.2-2)

Derivation path: TS 38.508-1 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
Extended protocol discriminator	'0111 1110'B	5GS mobility management messages	
Security header type	'0000'B	Plain 5GS NAS message, not security protected	
Spare half octet	'0000'B		
5GS network feature support	'0100 0001 0000 0000'B	Interworking without N26 interface supported	

Table 11.1.6.3.3-1: RRCRelease (step 6, table 11.1.6.3.2-1)

Derivation path: TS 38.508-1 [4] Table Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition

RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
redirectedCarrierInfo CHOICE {			
eutra SEQUENCE {			
eutraFrequency	Downlink EARFCN of cell 1		
cnType	epc		
}			
}			
}			
}			
}			
}			
}			

Table 11.1.6.3.3-1A: ATTACH REQUEST (step 8a1, table 11.1.6.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4.			
Information Element	Value/Remark	Comment	Condition
NAS key set identifier	KSI <sub>ASME</sub> that was created when the UE last registered to EPC E-UTRA		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI.		
Old GUTI type	"Native GUTI"		
ESM message container	PDN CONNECTIVITY REQUEST message to active PDU sessions which the UE intends to transfer to EPS.		

Table 11.1.6.3.3-1B: PDN CONNECTIVITY REQUEST (step 8a1, table 11.1.6.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.3-20			
Information Element	Value/remark	Comment	Condition

EPS bearer identity	0	No EPS bearer identity assigned	
Procedure transaction identity	Any value from 1 to 254		
PDN connectivity request message identity	'1101 0000'B	PDN connectivity request	
Request type	'010'B	Handover	
PDN type	Any value between '001'B, '010'B, '011'B and '100'B	The allowed values are respectively IPv4, IPv6, IPv4v6 and "unused but interpreted as IPv6 by the network"	
Protocol configuration options	PDU session ID of 5GS PDU session		

Table 11.1.6.3.3-2: TRACKING AREA UPDATE REQUEST (step 8b1, table 11.1.6.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-27, condition NR.			
Information Element	Value/Remark	Comment	Condition
"Active" flag	0001	Bearer Establishment requested	
EPS bearer context status	Present	EBI corresponding to active PDU Sessions need to be set to 1	
NAS key set identifier	KSI <sub>ASME</sub> that was created when the UE last registered to EPC E-UTRA		
Old GUTI	GUTI, mapped from the 5G-GUTI assigned at the initial registration when the UE entered N1		
Last visited registered TAI	The TAI the last visited E-UTRA Cell belonged to, if any. Not included if the UE does not have last stored EPC TAI.		
Old GUTI type	"Native GUTI"		
UE status	"UE is in 5GMM-REGISTERED state"		

Table 11.1.6.3.3-3: TRACKING AREA UPDATE REJECT (step8b2, table 11.1.6.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-26.			
Information Element	Value/Remark	Comment	Condition
EMM cause	'0000 1001'B	#9 "UE identity cannot be derived by the network"	

Table 11.1.6.3.3-4: ATTACH REQUEST (step 8b3, table 11.1.6.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-4.			
Information Element	Value/Remark	Comment	Condition
IMSI	IMSI of the UE		

11.1.7

Emergency call setup from NR RRC\_IDLE / Emergency Services Fallback to EPS with redirection / Single registration mode with N26 interface / Success

11.1.7.1

Test Purpose (TP)

(1)

*with* { UE supporting both S1 mode and N1 mode and operating in single-registration mode, and, the Network has indicated "interworking without N26 interface not supported", and, the UE in NR RRC\_IDLE state }

ensure that {

*when* { User initiates an Emergency call and the UE completes Access control and checking in 5GMM-IDLE mode }

*then* { UE requests the establishment of an Emergency call by transmitting an *RRCSetupRequest* message with *establishmentCause* set to 'emergency', and, a SERVICE REQUEST message with Service type set to 'emergency services fallback' }

    }

(2)

*with* { UE is NR RRC\_CONNECTED state after having requested a MMTEL call establishment and the MO IMS voice session establishment has been initiated }

ensure that {

*when* { UE receives a RRCRelease message which includes *redirectedCarrierInfo* indicating redirection with *cnType*=epc }

*then* { UE selects the E-UTRA cell, performs a TAU procedure, and, successfully completes the Emergency call setup in EPS }

    }

11.1.7.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclauses 5.6.1.1, 5.6.1.2, 5.6.1.4; TS 23.502 [31], subclause 4.13.4.2; TS 24.301 [21], subclauses 4.4.2.3, 5.5.3.2.2. Unless otherwise stated these are Rel-15 requirements.

NOTE: Conformance requirements in regard to establishing an emergency call in EPS are not provided. This can be found in IMS Emergency tests specified in TS 36.523-1 [13].

[TS 24.501, subclause 5.6.1.1]

The UE shall invoke the service request procedure when:

...

- h) the UE, in 5GMM-IDLE, 5GMM-CONNECTED mode over 3GPP access, or 5GMM-CONNECTED mode with RRC inactive indication, receives a request for emergency services fallback from the upper layer and performs emergency services fallback as specified in subclause 4.13.4.2 of 3GPP TS 23.502 [9]; or

[TS 24.501, subclause 5.6.1.2]

For case h) in subclause 5.6.1.1, the UE shall send a SERVICE REQUEST message with service type set to "emergency services fallback".

[TS 24.501, subclause 5.6.1.4]

For case h) in subclause 5.6.1.1, the UE shall treat the indication from the lower layers when the UE has changed to S1 mode or E-UTRA connected to 5GCN (see 3GPP TS 23.502 [9]) as successful completion of the procedure and stop timer T3517.

[TS 23.502, subclause 4.13.4.2]

The call flow in Figure 4.13.4.2-1 describes the procedure for emergency services fallback.

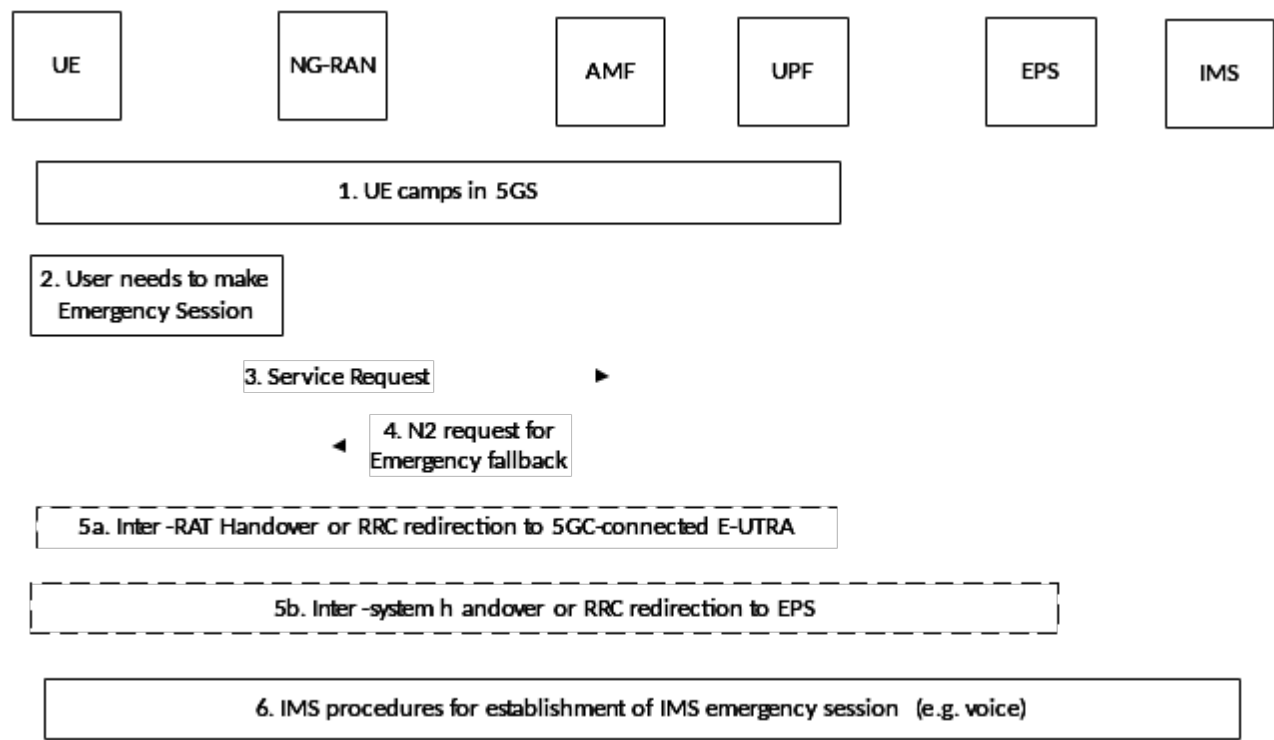


Figure 4.13.4.2-1: Emergency Services Fallback

1. UE camps on E-UTRA or NR cell in the 5GS (in either CM\_IDLE or CM\_CONNECTED state).
2. UE has a pending IMS emergency session request (e.g. voice) from the upper layers.

3. If the AMF has indicated support for emergency services using fallback via the Registration Accept message for the current RAT, the UE sends a Service Request message indicating that it requires emergency services fallback.

...

5. Based on the target CN indicated in message 4, one of the following procedures is executed by NG-RAN:

...

- 5b. NG-RAN initiates handover (see clause 4.11.1.2.1) or redirection to E-UTRAN connected to EPS. NG-RAN uses the security context provided by the AMF to secure the redirection procedure.

If the redirection procedure is used either in 5a or 5b the target CN is also conveyed to the UE in order to be able to perform the appropriate NAS procedures (S1 or N1 Mode).

[TS 24.301, subclause 4.4.2.3]

Secure exchange of NAS messages via a NAS signalling connection is usually established by the MME during the attach procedure by initiating a security mode control procedure. After successful completion of the security mode control procedure, all NAS messages exchanged between the UE and the MME are sent integrity protected using the current EPS security algorithms, and except for the messages specified in subclause 4.4.5, all NAS messages exchanged between the UE and the MME are sent ciphered using the current EPS security algorithms.

...

During inter-system change from N1 mode to S1 mode in 5GMM-IDLE mode, if the UE is operating in the single-registration mode and:

- 1) if the tracking area updating procedure is initiated as specified in 3GPP TS 24.501 [54], the UE shall transmit a TRACKING AREA UPDATE REQUEST message integrity protected with the current 5G NAS security context and the UE shall derive a mapped EPS security context (see subclause 8.6.1 of 3GPP TS 33.501 [56]). The UE shall include the eKSI indicating the 5G NAS security context value in the TRACKING AREA UPDATE REQUEST message.

After receiving the TRACKING AREA UPDATE REQUEST message including the eKSI, the MME forwards the TRACKING AREA UPDATE REQUEST message to the source AMF, if possible, to obtain the mapped EPS security context from the AMF as specified in 3GPP TS 33.501 [56]. The MME re-establishes the secure exchange of NAS messages by either:

- replying with a TRACKING AREA UPDATE ACCEPT message that is integrity protected and ciphered using the mapped EPS NAS security context. From this time onward, all NAS messages exchanged between the UE and the MME are sent integrity protected and except for the messages specified in subclause 4.4.5, all NAS messages exchanged between the UE and the MME are sent ciphered; or

[TS 24.301, subclause 5.5.3.2.2]

The UE in state EMM-REGISTERED shall initiate the tracking area updating procedure by sending a TRACKING AREA UPDATE REQUEST message to the MME,

...

- z) when the UE performs inter-system change from N1 mode to S1 mode in EMM-IDLE mode, the UE operates in single-registration mode, and conditions specified in 3GPP TS 24.501 [54] apply;

...

- zd) when the UE performs inter-system change from N1 mode to S1 mode in EMM-CONNECTED mode.

For all cases except case b, the UE shall set the EPS update type IE in the TRACKING AREA UPDATE REQUEST message to "TA updating". For case b, the UE shall set the EPS update type IE to "periodic updating".

...

When initiating a tracking area updating procedure while in S1 mode, the UE shall use the current EPS NAS integrity key to integrity protect the TRACKING AREA UPDATE REQUEST message, unless the UE is performing inter-system change from N1 mode to S1 mode.

...

If a UE has established PDN connection(s) and uplink user data pending to be sent via user plane when it initiates the tracking area updating procedure, or uplink signalling not related to the tracking area updating procedure when the UE does not support control plane CIoT EPS optimization, it may also set an "active" flag in the TRACKING AREA UPDATE REQUEST message to indicate the request to establish the user plane to the network and to keep the NAS signalling connection after the completion of the tracking area updating procedure.

...

If the UE has a current EPS security context, the UE shall include the eKSI (either  $KSI_{ASME}$  or  $KSI_{SGSN}$ ) in the NAS Key Set Identifier IE in the TRACKING AREA UPDATE REQUEST message. Otherwise, the UE shall set the NAS Key Set Identifier IE to the value "no key is available". If the UE has a current EPS security context, the UE shall integrity protect the TRACKING AREA UPDATE REQUEST message with the current EPS security context. Otherwise the UE shall not integrity protect the TRACKING AREA UPDATE REQUEST message.

...

For the case z and zd, the TRACKING AREA UPDATE REQUEST message shall be integrity protected using the 5GS security context available in the UE. The UE shall include a GUTI, mapped from 5G-GUTI (see 3GPP TS 23.501 [54] and 3GPP TS 23.003 [2]), in the Old GUTI IE in the TRACKING AREA UPDATE REQUEST message. In addition, the UE shall include Old GUTI type IE with GUTI set to "Native GUTI", and the UE shall include a UE status IE with a 5GMM registration status set to "UE is in 5GMM-REGISTERED state".

When the tracking area updating procedure is initiated in EMM-IDLE mode, the UE may also include an EPS bearer context status IE in the TRACKING AREA UPDATE REQUEST message, indicating which EPS bearer contexts are active in the UE. The UE shall include the EPS bearer context status IE in TRACKING AREA UPDATE REQUEST message:

- ...
- for the case z; and
- ...

If the UE initiates the first tracking area updating procedure following an initial registration in N1 mode and the UE is operating in the single-registration mode, the UE shall include a UE radio capability information update needed IE in the TRACKING AREA UPDATE REQUEST message.

...

If the UE supports NB-S1 mode, Non-IP PDN type, or N1 mode, then the UE shall support the extended protocol configuration options IE.

For all cases except case b, if the UE supports the extended protocol configuration options IE, then the UE shall set the ePCO bit to "extended protocol configuration options supported" in the UE network capability IE of the TRACKING AREA UPDATE REQUEST message.

...

For all cases except case b, if the UE supports dual connectivity with NR, then the UE shall set the DCNR bit to "dual connectivity with NR supported" in the UE network capability IE of the TRACKING AREA UPDATE REQUEST

message and shall include the UE additional security capability IE in the TRACKING AREA UPDATE REQUEST message.

...

For all cases except case b, if the UE supports N1 mode, the UE shall set the N1mode bit to "N1 mode supported" in the UE network capability IE of the TRACKING AREA UPDATE REQUEST message and shall include the UE additional security capability IE in the TRACKING AREA UPDATE REQUEST message.

11.1.7.3                    Test description

11.1.7.3.1                Pre-test conditions

System Simulator:

- 2 cells
- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2.
- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.

UE:

None.

Preamble:

- With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established
- the UE is switched-off
- With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

11.1.7.2                    Test procedure sequence

Table 11.1.7.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		



1	The SS configures: - E-UTRA Cell 1 as "Suitable neighbour intra-frequency cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3.	-	-	-	-
-	EXCEPTION: Unless otherwise stated the following messages are exchange on NR Cell 1.	-	-	-	-
2	Make the UE initiate an Emergency call.	-	-	-	-
3	Check: Does the UE transmit an <i>RRCSetupRequest</i> message with <i>establishmentCause</i> set to 'emergency'?	-->	NR RRC: <i>RRCSetupRequest</i>	1	P
4	The SS transmits an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>	-	-
5	Check: Does the UE transmit a SERVICE REQUEST message with Service type set to 'emergency services fallback'? NOTE: The UE shall request 'emergency services fallback' when the AMF has indicated support for emergency services using fallback via the Registration Accept message for the current RAT as per TS 23.502 [31], subclause 4.13.4.2.	-->	NR RRC: <i>RRCSetupComplete</i> 5GMM: SERVICE REQUEST	1	P
6	SS transmits <i>RRCRelease</i> message indicating redirection to E-UTRA Cell 1.	<--	NR RRC: <i>RRCRelease</i>		
-	EXCEPTION: Unless otherwise stated the following messages are exchange on E-UTRA Cell 1.	-	-	-	-
7	The UE transmits an <i>RRCConnectionRequest</i> message with 'establishmentCause' set to 'emergency'.	-->	RRC: <i>RRCConnectionRequest</i>	2	P
8-10b 2	Steps 2-4b2 from the Tracking area updating procedure as specified in TS 38.508-1 [4], Table 4.9.7.2.2-1 are performed (UE performs inter-system change from N1 to S1, mapped EPS NAS security context from the 5GC).	-	-	-	-
10A-10D	Steps 5-8 from the Generic Test Procedure for IMS Emergency call establishment in EUTRA: Normal Service as specified in TS 36.508 [7], Table 4.5A.4.3-1 are performed	-	-	-	-
10E	SS responds with TRACKING AREA UPDATE ACCEPT message.	<--	RRC: <i>DLInformationTransfer</i> NAS: TRACKING AREA UPDATE ACCEPT	-	-
11	Check: Does the UE transmit a TRACKING AREA UPDATE COMPLETE message?	-->	RRC: <i>ULInformationTransfer</i> NAS: TRACKING AREA UPDATE COMPLETE	2	P
12-17	Steps 9-14 from the Generic Test Procedure for IMS Emergency call establishment in EUTRA: Normal Service as specified in TS 36.508 [7], Table 4.5A.4.3-1 are performed.	-	-	-	-
18-19	Void				
20	Check: Does the UE transmit an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message?	-->	RRC: <i>ULInformationTransfer</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT	2	P
21	The SS waits 1 second.	-	-	-	-
22	Release IMS Call as specified in the generic procedure in TS 34.229-1 [35] subclause C.32.	-	-	-	-

11.1.7.3.3

Specific message contents

Table 11.1.7.3.3-1: REGISTRATION REQUEST (Preamble; TS 38.508-1 [4], Table 4.5.2.2-2)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6			
Information Element	Value/remark	Comment	Condition
5GMM capability	'0000 0xx1'	S1 mode supported	
		x - not checked	

Table 11.1.7.3.3-2: REGISTRATION ACCEPT (Preamble; TS 38.508-1 [4], Table 4.5.2.2-2)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition
5GS network feature support			
Emergency service fallback indicator for 3GPP access (EMF) (octet 3, bit 5 and bit 6)	'01'	Emergency services fallback supported in NR connected to 5GCN only	

Table 11.1.7.3.3-3: RRCSetupRequest (step 3, table 11.1.7.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-23			
Information Element	Value/remark	Comment	Condition
RRCSetupRequest ::= SEQUENCE {			
rrcSetupRequest SEQUENCE {			
establishmentCause	emergency		
}			
}			

Table 11.1.7.3.3-4: SERVICE REQUEST (step 5, table 11.1.7.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-16			
Information Element	Value/Remark	Comment	Condition
Service type	'0100'B	emergency services fallback	

Table 11.1.7.3.3-5: RRCRelease (step 6, table 11.1.7.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition

RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
redirectedCarrierInfo CHOICE {			
eutra SEQUENCE {			
eutraFrequency	Downlink EARFCN of E-UTRA Cell 1		
cnType	epc		
}			
}			
}			
}			
}			
}			
}			

Table 11.1.7.3.3-6: RRCConnectionRequest (step 7, Table 11.1.7.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.6.1-16			
Information Element	Value/remark	Comment	Condition
RRCConnectionRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcConnectionRequest-r8 SEQUENCE {			
establishmentCause	emergency		
}			
}			
}			

Table 11.1.7.3.3-7: Void

Table 11.1.7.3.3-8: Void

Table 11.1.7.3.3-8a: TRACKING AREA UPDATE ACCEPT (Step 10D, Table 11.1.7.3.2-1)

Derivation Path: TS 36.508 [2], Table 4.7.2-24, condition NR.
---

Table 11.1.7.3.3-9: Message PDN CONNECTIVITY REQUEST (step 14, Table 11.1.7.3.2-1)

Derivation Path: TS 36.508 [7], Table 4.7.2-1.			
Information Element	Value/Remark	Comment	Condition
Request type	'0100'B	emergency	
Access point name	Not present		

Table 11.1.7.3.3-10: Message ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST (step 15, Table 11.1.7.3.2-1)

Derivation path: TS 36.508 [7], Table 4.7.3-6 and table 4.6.1-8 with condition UM-DRB-ADD(2).			
Information Element	Value/Remark	Comment	Condition

EPS bearer identity	an additional EPS Bearer Id different from default EPS Bearer Id or/and any mapped EPS bearer		
Access point name	sos	APN value as recommended by IR.88 clause 6.4 [39]	

11.1.8

11.1.9 MO MMTEL voice call setup from NR RRC\_IDLE / EPS Fallback with redirection / Single registration mode with N26 interface / voiceFallbackIndication

11.1.9.1 Test Purpose (TP)

(1)

with { UE being in NR RRC\_CONNECTED state after having requested an MMTEL call establishment and the MO IMS voice session establishment has been initiated }

ensure that {

when { UE receives an RRCRelease message which includes redirectedCarrierInfo indicating redirection to E-UTRA and with voiceFallbackIndication }

then {UE selects the E-UTRA cell, uses “mo-VoiceCall” as the establishment cause value in RRC Connection Request, performs a TAU procedure, and, successfully completes the MMTEL call setup in EPS }

}

11.1.9.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.501, clauses 4.5.4.1; TS 38.331, clause 5.3.8.3, 5.3.11. Unless otherwise stated these are Rel-16 requirements.

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following:

- a) subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, if the UE is not operating in SNPN access mode; or
- b) subclause 4.5.2A, table 4.5.2A.1 and table 4.5.2A.2, and subclause 4.5.3, if the UE is operating in SNPN access mode,

and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2.1, regardless of the access category for which the access barring check is performed.

If the UE is registered for 5GS services with control plane CIoT 5GS optimization has uplink user data pending for one or more PDU sessions when it builds a CONTROL PLANE SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions as specified in subclause 5.6.1.2.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

[TS 38.331, clause 5.3.8.3]

The UE shall:

- 1> delay the following actions defined in this sub-clause 60 ms from the moment the *RRCRelease* message was received or optionally when lower layers indicate that the receipt of the *RRCRelease* message has been successfully acknowledged, whichever is earlier;
- 1> stop timer T380, if running;
- 1> stop timer T320, if running;
- 1> if timer T316 is running;
  - 2> stop timer T316;
  - 2> clear the information included in *VarRLF-Report*, if any;
- 1> stop timer T350, if running;
- 1> if the AS security is not activated:
  - 2> ignore any field included in *RRCRelease* message except *waitTime*;
  - 2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with the release cause 'other' upon which the procedure ends;
- 1> if the *RRCRelease* message includes *redirectedCarrierInfo* indicating redirection to *eutra*:
  - 2> if *cnType* is included:
    - 3> after the cell selection, indicate the available CN Type(s) and the received *cnType* to upper layers;

NOTE 1: Handling the case if the E-UTRA cell selected after the redirection does not support the core network type specified by the *cnType*, is up to UE implementation.

- 2> if *voiceFallbackIndication* is included:
  - 3> consider the RRC connection release was for EPS fallback for IMS voice (see TS 23.502 [43]);

[TS 38.331, clause 5.3.11]

UE shall:

- 1> reset MAC;
- 1> if T302 is running:

2> stop timer T302;

2> perform the actions as specified in 5.3.14.4;
- 1> stop all timers that are running except T320 and T325;
- 1> discard the UE Inactive AS context;
- 1> set the variable *pendingRnaUpdate* to *false*, if that is set to *true*;
- 1> discard the  $K_{gNB}$ , the  $K_{RRCenc}$  key, the  $K_{RRCint}$ , the  $K_{UPint}$  key and the  $K_{UPenc}$  key, if any;
- 1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity and SDAP for all established RBs;
- 1> indicate the release of the RRC connection to upper layers together with the release cause;
- 1> enter RRC\_IDLE and perform cell selection as specified in TS 38.304 [20], except if going to RRC\_IDLE was triggered by selecting an inter-RAT cell while T311 was running;
- 1> if going to RRC\_IDLE was triggered by reception of the *RRCRelease* message including a *waitTime*:

2> start timer T302 with the value set to the *waitTime*;

2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2'.

11.1.9.3

Test description

11.1.9.3.1

Pre-test conditions

System Simulator:

- 2 cells
- NR Cell 1 is configured according to TS 38.508-1 [4] Table 4.4.2-3 and is connected to 5GC.
- E-UTRA Cell 1 is configured to TS 36.508 [7] Table 4.4.2-2 and is connected to EPC.
- System information for the NR Cell 1 in accordance with combination NR-6 in TS 38.508-1 [4] sub-clause 4.4.3.1.2, and, for the E-UTRA Cell 1 in accordance with system information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.
- Power levels are constant and as defined in Table 11.1.9.3.1-1

Table 11.1.9.3.1-1: Cell power levels

	Parameter name	Unit	NR Cell 1	E-UTRA Cell 1
--	----------------	------	-----------	---------------

T0	SS/PBCH SSS EPRE	dBm/SCS	"Serving Cell"	
	RS EPRE	dBm/15kHz		"Serving Cell"

UE:

None.

Preamble:

With E-UTRA Cell 1 "Serving cell" and NR Cell 1 "Non-suitable "Off" cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state RRC\_IDLE Connectivity (*E-UTRA/EPC*) in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-1. 4G GUTI and eKSI are assigned and security context established

The UE is switched-off

With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2. 5G-GUTI and ngKSI are assigned and security context established.

11.1.9.3.2

Test procedure sequence

Table 11.1.9.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

0	Set the power levels according to “T0” as per Table 11.1.9.3.1-1.	-	-	-	-
1	Make the UE attempt an MTSI MO Speech Call (Note 1).	-	-	-	-
2	UE sends NR <i>RRCSetupRequest</i> with <i>EstablishmentCause</i> set to ‘ <i>mo-VoiceCall</i> ’.	-->	NR RRC: <i>RRCSetupRequest</i>	-	-
3	SS transmits an NR <i>RRCSetup</i> message	<--	NR RRC: <i>RRCSetup</i>	-	-
4	UE transmits an NR <i>RRCSetupComplete</i> message to confirm the successful completion of the connection establishment including initiation of 5GSM procedure by including the SERVICE REQUEST message with <i>Service Type</i> set to ‘ <i>data</i> ’.	-->	NR RRC: <i>RRCSetupComplete</i> 5GSM: SERVICE REQUEST	-	-
8	Steps 5-8 of expected sequence from Table 4.5.4.2-3 as defined in TS 38.508-1 [4] are performed.	-	-	-	-
9-13	Steps 1-5 of expected sequence from A.9.1 as defined in TS 34.229-5 [41] are performed for setting up MTSI MO speech call - EPS fallback.	-	-	-	-
14	SS transmits <i>RRCRelease</i> message indicating redirection to E-UTRA Cell 1.	<--	NR RRC: <i>RRCRelease</i>	-	-
-	EXCEPTION: Unless otherwise stated all the messages below are transmitted on the cell specified in the test case.	-	-	-	-
15	The UE transmits an <i>RRCCConnectionRequest</i> message on the cell specified in the test case.	-->	RRC: <i>RRCCConnectionRequest</i>	1	P
16-20	UE performs generic procedure as defined in TS 38.508-1 [4], Table 4.9.7.2.2-1 Steps 2-6 for N1 to S1 Inter mode change with condition ‘connected without release’ & ‘mapped 5G security context’.	-	-	-	-
21-24	Generic Test Procedure as defined in Steps 5-8 of TS 36.508-1 [4] Table 4.5A.6.3-1 is performed to establish radio bearer corresponding to IMS PDN.	-	-	-	-
-	EXCEPTION: Steps 25a1-25a2 describe a step sequence depending on UE implementation.	-	-	-	-
25a1-25a2	The UE may perform steps 1-2 according to TS 34.229-1 subclause C.46 to perform IMS re-registration on EUTRAN.	-	-	-	-
26	The SS configures a new RLC-UM data radio bearer with condition DRB (0,1), associated with the dedicated EPS bearer context. <i>RRCCConnectionReconfiguration</i> message contains the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message. EPS bearer context #4 (QCI 1) according to table 6.6.2-1: Reference dedicated EPS bearer contexts.	<--	RRC: <i>RRCCConnectionReconfiguration</i> NAS: ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST	-	-
-	EXCEPTION: In parallel to the events described in steps 27-28 the steps specified in table 11.1.9.3.2-2 will take place.	-	-	-	-
27	The UE transmits an <i>RRCCConnectionReconfigurationComplete</i> message to confirm the establishment of the new data radio bearer, associated with the dedicated EPS bearer.	-->	RRC: <i>RRCCConnectionReconfigurationComplete</i>	-	-
28	The UE transmits an ACTIVATE DEDICATED	-->	RRC: <i>ULInformationTransfer</i>	1	P



	EPS BEARER CONTEXT ACCEPT message.		NAS:ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT		
29	UE is triggered by MMI to release the call.	-	-	-	-
30-33	Follow the Test Steps 2-5 as defined in TS 34.229-1 [35] subclause C.32 for Generic test procedure for MO release of IMS call followed by EPS Bearer Deactivation.	-	-	-	-

Table 11.1.9.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-4	Steps 1 to 4 of the the generic procedure “EPS Fallback for Voice Call / steps after fallback / 5GS” as defined in Appendix A.9.2 of TS 34.229-5 [41] take place.	-	-	-	-
5	Check: Does the UE perform step 5 of the generic procedure “EPS Fallback for Voice Call / steps after fallback / 5GS” as defined in Appendix A.9.2 of TS 34.229-5 [41] take place?	-->	SIP: ACK	1	P

11.1.9.3.3 Specific message contents

Table 11.1.9.3.3-1: RRCRelease (step 6, table 11.1.9.3.2-1)

Derivation path: TS 38.508-1 [4] Table Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition
RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
redirectedCarrierInfo CHOICE {			
eutra SEQUENCE {			
eutraFrequency	Downlink EARFCN of cell 1		
cnType	epc		
}			
}			
}			
nonCriticalExtension {			
nonCriticalExtension {			
voiceFallbackIndication-r16	true		
}			
}			
}			
}			

Table 11.1.9.3.3-2: RRCConnectionRequest (step 15, table 11.1.9.3.2-1)

Derivation path: TS 36.508-1 Table Table 4.6.1-16			
Information Element	Value/Remark	Comment	Condition

RRCCONNECTIONREQUEST ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcConnectionRequest-r8 SEQUENCE {			
ue-Identity CHOICE {			
s-TMSI	Any allowed value		
}			
establishmentCause	mo-VoiceCall-v1280	mo-VoiceCall	
spare	Present but contents not checked		
}			
}			
}			

11.2 5GS/RAT Fallback

FFS

11.3 Unified Access Control (UAC)

11.3.1 UAC / Access Identity 0 / 0% access probability / MTSI MO speech call/SMSoIP/Uplink User data transfer

11.3.1.1 Test Purpose (TP)

(1)

with { UE not configured for special AIs (1,2,11-15) having received a SIB1 message indicating UAC Info set to 0% accessibility for Access category 4 and in NR RRC\_IDLE }

ensure that {

    when { User initiates MMTEL Voice call }

        then { UE does not initiate connection over NR Cell }

    }

(2)

with { UE not configured for special AIs (1,2,11-15) , previously barred for MO MTSI MMTEL Voice in NR RRC\_IDLE & current SIB1 indicates no access barred as part of UAC Info }

ensure that {

    when { user tries another MO MTSI MMTEL Voice session after T390 expires }

        then { UE is able to successfully establish MMTEL Voice session }

    }

(3)

with { UE not configured for special AIs (1,2,11-15) with SIB1 indicating UAC info set to 0% accessibility for Access category 6 in NR RRC\_CONNECTED state }

```
ensure that {  
  when { user tries to send SMS over IP }  
  then { UE does not initiate SMS access attempt }  
}
```

(4)

```
with { UE not configured for special AIs (1,2,11-15) , with at least one PDU Session in 5GSM PDU  
SESSION ACTIVE state (with user plane suspended) in NR RRC_INACTIVE state & SIB1 indicating 0%  
accessibility for Access Category 7 in NR RRC_INACTIVE state }  
  
ensure that {  
  when { User initiates uplink user data packet to be sent for a PDU session with suspended user-  
plane resources }  
  then { UE does not send the data packet }  
}
```

11.3.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in TS 24.501: clause 4.5.2, 4.5.4.1, 4.5.4.2 and 4.5.6 and TS 38.331: clause 5.3.14.1, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a) for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and
- b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration
------------------------	------------------

0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
<div>NOTE 1: Access identity 1 is valid when:<ul style="list-style-type: none"><li>- the USIM file EFUAC_AIC indicates the UE is configured for access identity 1 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or</li><li>- the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.</li></ul></div> <div>NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when:<ul style="list-style-type: none"><li>- the USIM file EFUAC_AIC indicates the UE is configured for access identity 2 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or</li><li>- the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.</li></ul></div> <div>NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).</div>	

The UE uses the MPS indicator bit of the 5GS network feature support IE to determine if access identity 1 is valid. Processing of the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 1 to be valid when the UE is not in the country of its HPLMN prior to receiving the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 1 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 1 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 1, the UE uses the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 1 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 1, the MPS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

The UE uses the MCS indicator bit of the 5GS network feature support IE to determine if access identity 2 is valid. Processing of the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 2 to be valid when the UE is not in the country of its HPLMN prior to receiving the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 2 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 2, the UE uses the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 2 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 2, the MCS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
--------	------------------------	------------------------	-----------------

1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message	Access attempt is for MT access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b).the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call (NOTE 2)	4 (= MO MMTel voice)
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)
7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
9	UE NAS initiated 5GMM connection management procedure or 5GMM NAS transport procedure	Access attempt is for MO data	7 (= MO_data)
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".<			
NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service, or for			

	the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.
NOTE 3:	If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RLPMN or a PLMN equivalent to the RPLMN.
NOTE 4:	This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.
NOTE 5:	The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.
NOTE 6:	If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.
NOTE 7:	"EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.
NOTE 8:	For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];

- 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
- 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.5.4.2]

When the UE is in 5GMM-CONNECTED mode or 5GMM-CONNECTED mode with RRC inactive indication, upon detecting one of events 1) through 6) listed in subclause 4.5.1, the NAS shall categorize the corresponding access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.2.3, and provide the access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message for the access attempt, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 2: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall take the following action depending on the event which triggered the access attempt:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication, an MO-MMTEL-video-call-started indication or an MO-SMSoIP-attempt-started indication, the NAS shall notify the upper layers that the access attempt is allowed;
- b) if the event which triggered the access attempt was a request from upper layers to send a mobile originated SMS over NAS, 5GMM shall initiate the NAS transport procedure as specified in subclause 5.4.5 to send the SMS in an UL NAS TRANSPORT message;



- c) if the event which triggered the access attempt was a request from upper layers to establish a new PDU session, 5GMM shall initiate the NAS transport procedure as specified in subclause 5.4.5 to send the PDU SESSION ESTABLISHMENT REQUEST message;
- d) if the event which triggered the access attempt was a request from upper layers to modify an existing PDU session, 5GMM shall initiate the NAS transport procedure as specified in subclause 5.4.5 to send the PDU SESSION MODIFICATION REQUEST message;
- e) if the event which triggered the access attempt was a request to re-establish the user-plane resources for an existing PDU session, 5GMM shall initiate the service request procedure as specified in subclause 5.6.1; and
- f) if the event which triggered the access attempt was an uplink user data packet to be sent for a PDU session with suspended user-plane resources, 5GMM shall consider that the uplink user data packet is allowed to be sent.

If the lower layers indicate that the access attempt is barred, the NAS shall take the following action depending on the event which triggered the access attempt:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication, an MO-MMTEL-video-call-started indication or an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 2) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category;

NOTE 3: In this case prohibiting the initiation of the MMTEL voice session, MMTEL video session or prohibiting sending of the SMS over IP is performed by the upper layers.

- b) if the event which triggered the access attempt was a request from upper layers to send a mobile originated SMS over NAS, 5GMM shall not initiate the NAS transport procedure as specified in subclause 5.4.5 to send the SMS in an UL NAS TRANSPORT message. Upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, 5GMM may initiate the NAS transport procedure as specified in subclause 5.4.5 to send the SMS in an UL NAS TRANSPORT message, if still needed;
- c) if the event which triggered the access attempt was a request from upper layers to establish a new PDU session, 5GMM shall not initiate the NAS transport procedure to send the PDU SESSION ESTABLISHMENT REQUEST message. Upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS may initiate the NAS transport procedure as specified in subclause 5.4.5, if still needed;
- d) if the event which triggered the access attempt was a request from upper layers to modify an existing PDU session modification, 5GMM shall not initiate the NAS transport procedure to send the PDU SESSION MODIFICATION REQUEST message. Upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS may initiate the NAS transport procedure as specified in subclause 5.4.5, if still needed;
- e)- if the event which triggered the access attempt was a request to re-establish the user-plane resources for an existing PDU session, the NAS shall not initiate the service request procedure as specified in subclause 5.6.1. Upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS may initiate the service request procedure as specified in subclause 5.6.1, if still needed; and

- f) if the event which triggered the access attempt was an uplink user data packet to be sent for a PDU session with suspended user-plane resources, 5GMM shall consider that the uplink user data packet is not allowed to be sent. Upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall consider that the barring is alleviated for the access category.

[TS 24.501, clause 4.5.6]

When 5GMM requests the establishment of a NAS-signalling connection, the RRC establishment cause used by the UE shall be selected according to one or more access identities (see subclause 4.5.2) and the determined access category as specified in table 4.5.6.1 and table 4.5.6.2. If the determined access category is an operator-defined access category, then the RRC establishment cause used by the UE shall be selected according to table 4.5.6.1 and table 4.5.6.2 based on one or more access identities (see subclause 4.5.2) and the standardized access category determined for the operator-defined access category as described in subclause 4.5.3.

Table 4.5.6.1: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via NR connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VideoCall
	6 (= MO SMS and SMSoIP)	mo-SMS
	7 (= MO_data)	mo-Data
1	Any category	mps-PriorityAccess
2	Any category	mcs-PriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

Table 4.5.6.2: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via E-UTRA connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VoiceCall
	6 (= MO SMS and SMSoIP)	mo-Data
	7 (= MO_data)	mo-Data
1	Any category	highPriorityAccess
2	Any category	highPriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

[TS 38.331, clause 5.3.14.1]

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a handover resulting in change of PCell in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SIB1*) from the target cell.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
  - 2> consider the access attempt as barred;
- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):
      - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;
      - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
    - 3> else if *SIB1* includes *uac-BarringForCommon*:
      - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
    - 3> else:
      - 4> consider the access attempt as allowed;
    - 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
      - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
        - 5> select the *UAC-BarringPerCat* entry;
        - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
          - 6> select the *UAC-BarringInfoSet* entry;

- 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected UAC-BarringInfoSet as "UAC barring parameter";
- 5> else:
  - 6> consider the access attempt as allowed;
- 4> else:
  - 5> consider the access attempt as allowed;
- 3> else if the uac-ACBarringListType indicates that uac-ImplicitACBarringList is used:
  - 4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;
  - 4> if the uac-BarringInfoSetList contains the UAC-BarringInfoSet entry corresponding to the selected uac-BarringInfoSetIndex:
    - 5> select the *UAC-BarringInfoSet* entry;
    - 5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
  - 4> else:
    - 5> consider the access attempt as allowed;
- 3> else:
  - 4> consider the access attempt as allowed;
- 1> if the access barring check was requested by upper layers:
  - 2> if the access attempt is considered as barred:
    - 3> if timer T302 is running:
      - 4> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;
    - 3> else:
      - 4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;
  - 2> else:
    - 3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;
- 1> else:
  - 2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

- 1> if timer T302 expires or is stopped, and if timer T390 corresponding to an Access Category is not running; or

- 1> if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running; or
- 1> if timer T390 corresponding to the Access Category '2' expires or is stopped:

2> consider the barring for this Access Category to be alleviated;
- 1> when barring for an Access Category is considered being alleviated:

2> if the Access Category was informed to upper layers as barred:

3> inform upper layers about barring alleviation for the Access Category.

2> if barring is alleviated for Access Category '8':

3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:

2> consider the access attempt as allowed;
- 1> else:

2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;

2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":

3> consider the access attempt as allowed;

2> else:

3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:

2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;

2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":

T390 =  $(0.7 + 0.6 * rand) * uac-BarringTime$ .

11.3.1.3

Test description

11.3.1.3.1

Pre-test conditions

System Simulator:

- NR Cell 1.
- Cell power level is selected according to 38.508-1 [4] Table 6.2.2.1-3.
- System information combination NR-1 as defined in TS 38.508-1 [4] Table 4.4.3.1.2-1 is used in NR cell 1.

UE:

- None.

Preamble:

- The UE is in state 3N-A on NR Cell 1(serving cell) with at least one PDU session active according to TS 38.508-1 [4] Table 4.4A.2-1 and using the message condition UE TEST LOOP MODE B active with IP PDU delay = 1 second according to TS 38.508-1 [4]. DRB 1 is defined as default DRB for the PDU session.

11.3.1.3.2 Test procedure sequence

Table 11.3.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	SS changes <i>SIB1</i> according to Table 11.3.1.3.3-1 and send Short Message on PDCCH using P-RNTI. Wait for 2.1* modification period to allow the new system information to take effect.	<--	PDCCH (DCI 1_0): Short Message	-	-
2	The SS transmits one IP PDU.	-	-	-	-
3	The SS transmits an <i>RRCRelease</i> message with <i>suspendConfig</i> IE and move the UE to <i>RRC_Inactive</i> state.	<--	NR RRC: <i>RRCRelease</i>	-	-
4	Check: Does the UE transmit <i>RRCResumeRequest</i> message including <i>mo-Data</i> as resume cause within 6 s?	-->	NR RRC: <i>RRCResumeRequest</i>	4	F
5	SS changes <i>SIB1</i> according to Table 11.3.1.3.3-1 and send Short Message on PDCCH using P-RNTI. Wait for the new system information to take effect and T390 expire. (Note 1)	<--	PDCCH (DCI 1_0): Short Message	-	-
6	The UE transmits <i>RRCResumeRequest</i> message including <i>mo-Data</i> as resume cause.	-->	NR RRC: <i>RRCResumeRequest</i>	-	-
7	SS transmits an NR <i>RRCResume</i> message	<--	NR RRC: <i>RRCResume</i>	-	-
8	The UE transmits an NR <i>RRCResumeComplete</i> message to confirm the successful completion of the connection resumption.	-->	NR RRC: <i>RRCResumeComplete</i>	-	-
9	The UE loop back the IP PDU.	-	-	-	-
10	The SS transmits DEACTIVATE TEST MODE message.	<--	DEACTIVATE TEST MODE	-	-
11	The UE transmits DEACTIVATE TEST MODE COMPLETE message.	-->	DEACTIVATE TEST MODE COMPLETE	-	-
12	The SS transmits an <i>RRCRelease</i> message to release RRC connection and move the UE to <i>RRC_IDLE</i> .	<--	NR RRC: <i>RRCRelease</i>	-	-
13	Make the UE attempt a MMTel voice call.	-	-	-	-
14	Check: Does the UE transmit <i>RRCSetupRequest</i> message including <i>mo-VoiceCall</i> with within 6 s?	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
15	SS changes <i>SIB1</i> according to Table 11.3.1.3.3-1 and sends Short Message on PDCCH using P-RNTI. Wait for the new system information to take effect and T390 expire. (Note 1)	<--	PDCCH (DCI 1_0): Short Message	-	-
16	Make the UE attempt another MO MTSI MMTEL Voice session.	-	-	-	-
17	Check: Does the UE send NR <i>RRCSetupRequest</i> with <i>EstablishmentCause</i> set to ' <i>mo-VoiceCall</i> '?	-->	NR RRC: <i>RRCSetupRequest</i>	2	P
18-	Step3 to step13 from test procedure for IMS MO	-	-	-	-

28	speech call establishment as described in TS 38.508-1 [4] Table 4.9.15.2.2-1 take place,				
29-31	Step1 to step3 from test procedure for test procedure for IMS MO speech call release as described in TS 38.508-1 [4] Table 4.9.17.2.2-1 take place,	-	-	-	-
32	AT command to make the UE attempt to send SMS over IP	-	-	-	-
33	Check: Does the UE transmit an <i>RRCSetupRequest</i> message with 'establishmentCause' set to 'mo-Data'?	-->	NR RRC: <i>RRCSetupRequest</i>	3	F
34	SS changes <i>SIB1</i> according to Table 11.3.1.3.3-1 and sends Short Message on PDCCH using P-RNTI. Wait for the new system information to take effect and T390 expire. (Note 1)	<--	PDCCH (DCI 1_0): Short Message	-	-
35	AT command to make the UE attempt to send another SMS over IP	-	-	-	-
36-49	Steps 2-15 from generic procedure IMS MO SMS in 5GS as described in TS 38.508-1 [4] Table 4.9.19.2.2-1 take place.	-	-	-	-
Note 1: T390 is a random value between $(0.7 + 0.6 * 0) * \text{uac-BarringTime}(16\text{s}) = 11.2\text{s}$ and $(0.7 + 0.6 * 1) * \text{uac-BarringTime}(16\text{s}) = 20.8\text{s}$ .					

11.3.1.3.3 Specific message contents

Table 11.3.1.3.3-1: *SIB1* of NR Cell 1 (All steps, Table 11.3.1.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition

SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	7	(= MO_data)	Step 1
	4	(= MO MMTel voice)	Step 5
	6	(= MO SMS and SMSoIP)	Step 15
uac-barringInfoSetIndex	1	Value 1 corresponds to the first entry in uac-BarringInfoSetList	
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00	0% access probability	
uac-BarringTime	s16	16 s	
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
uac-BarringInfo	Not present		Step 34
}			

11.3.2 UAC / Access Identity 0 / 0% access probability / Paging for MT Access/Emergency Call

11.3.2.1 Test Purpose (TP)

(1)

with { UE not configured for special AIs (1,2,11-15) having received a SIB1 message indicating 0% accessibility for all Access Categories in NR RRC\_Idle state }

ensure that {  
  when { UE is paged for MT access }  
    then { UE does not consider the access as barred and initiates RRC Connection }  
}

(2)

with { UE not configured for special AIs (1,2,11-15) having received a SIB1 message including UAC Info set to 0% accessibility for Access Category 2 in NR RRC\_Idle state }

ensure that {  
  when { UE attempts emergency call }  
    then { UE does not initiate emergency call }  
}



}

(3)

**with** { UE not configured for special AIs (1,2,11-15) with T302 running but T390 expired for Access Category 2 and with SIB1 including UAC Info indicating 100% accessibility for Access Category 2 in NR RRC\_IDLE state }

**ensure that** {

**when** { UE attempts emergency call }

**then** { UE does not consider the access attempt as barred and initiates the emergency call }

}

11.3.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in TS 24.501: clause 4.5.2, 4.5.4.1 and 4.5.6 and TS 38.331: clause 5.3.14.1, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a) for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and
- b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration

0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
<div>NOTE 1: Access identity 1 is valid when:<ul style="list-style-type: none"><li>- the USIM file EFUAC_AIC indicates the UE is configured for access identity 1 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or</li><li>- the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.</li></ul></div> <div>NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when:<ul style="list-style-type: none"><li>- the USIM file EFUAC_AIC indicates the UE is configured for access identity 2 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or</li><li>- the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.</li></ul></div> <div>NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).</div>	

The UE uses the MPS indicator bit of the 5GS network feature support IE to determine if access identity 1 is valid. Processing of the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 1 to be valid when the UE is not in the country of its HPLMN prior to receiving the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 1 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 1 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 1, the UE uses the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 1 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 1, the MPS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

The UE uses the MCS indicator bit of the 5GS network feature support IE to determine if access identity 2 is valid. Processing of the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 2 to be valid when the UE is not in the country of its HPLMN prior to receiving the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 2 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 2, the UE uses the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 2 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 2, the MCS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message	Access attempt is for MT access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b).the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call (NOTE 2)	4 (= MO MMTel voice)
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)
7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
9	UE NAS initiated 5GMM	Access attempt is for MO data	7 (= MO_data)

	connection management procedure or 5GMM NAS transport procedure		
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
<p>NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".&lt;</p> <p>NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.</p> <p>NOTE 3: If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RLPMN or a PLMN equivalent to the RPLMN.</p> <p>NOTE 4: This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.</p> <p>NOTE 5: The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.</p> <p>NOTE 6: If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.</p> <p>NOTE 7: "EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.</p> <p>NOTE 8: For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).</p>			

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.5.6]

When 5GMM requests the establishment of a NAS-signalling connection, the RRC establishment cause used by the UE shall be selected according to one or more access identities (see subclause 4.5.2) and the determined access category as specified in table 4.5.6.1 and table 4.5.6.2. If the determined access category is an operator-defined access category, then the RRC establishment cause used by the UE shall be selected according to table 4.5.6.1 and table 4.5.6.2 based on one or more access identities (see subclause 4.5.2) and the standardized access category determined for the operator-defined access category as described in subclause 4.5.3.

Table 4.5.6.1: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via NR connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VideoCall
	6 (= MO SMS and SMSoIP)	mo-SMS
	7 (= MO_data)	mo-Data
1	Any category	mps-PriorityAccess
2	Any category	mcs-PriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

Table 4.5.6.2: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via E-UTRA connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VoiceCall
	6 (= MO SMS and SMSoIP)	mo-Data
	7 (= MO_data)	mo-Data
1	Any category	highPriorityAccess
2	Any category	highPriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

[TS 38.331, clause 5.3.14.1]

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a handover resulting in change of PCell in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SIB1*) from the target cell.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
- 2> consider the access attempt as barred;

- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):
      - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;
      - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
    - 3> else if *SIB1* includes *uac-BarringForCommon*:
      - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
    - 3> else:
      - 4> consider the access attempt as allowed;
  - ...
  - 1> if the access barring check was requested by upper layers:
    - 2> if the access attempt is considered as barred:
      - 3> if timer T302 is running:
        - 4> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;
      - 3> else:
        - 4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;
    - 2> else:
      - 3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;
  - 1> else:
    - 2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

- 1> if timer T302 expires or is stopped, and if timer T390 corresponding to an Access Category is not running; or

- 1> if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running; or
- 1> if timer T390 corresponding to the Access Category '2' expires or is stopped:

2> consider the barring for this Access Category to be alleviated;
- 1> when barring for an Access Category is considered being alleviated:

2> if the Access Category was informed to upper layers as barred:

3> inform upper layers about barring alleviation for the Access Category.

2> if barring is alleviated for Access Category '8':

3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:

2> consider the access attempt as allowed;
- 1> else:

2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;

2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":

3> consider the access attempt as allowed;

2> else:

3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:

2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;

2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":

T390 =  $(0.7 + 0.6 * rand) * uac-BarringTime$ .

11.3.2.3

Test description

11.3.2.3.1

Pre-test conditions

System Simulator:

- NR Cell 1.
- System information combination NR-1 as defined in TS 38.508-1 [4] Table 4.4.3.1.2-1 is used in NR cell 1 with SIB 1 modified as per Table 11.3.2.3.3-1.



UE:

- None.

Preamble:

- The UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2.

11.3.2.3.2 Test procedure sequence

Table 11.3.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE attempt an emergency call dialling a number which is stored on the ME (e.g. 112 or 911). (Note 1)	-	-	-	-
2	Check: Does the UE transmit an <i>RRCSetupRequest</i> message with <i>establishmentCause</i> set to 'emergency' within 30 s'?	-->	NR RRC: <i>RRCSetupRequest</i>	2	F
3	SS changes <i>SIB1</i> according to Table 11.3.2.3.3-2 and sends Short Message on PDCCH using P-RNTI. Wait for 2.1* modification period to allow the new system information to take effect and T390 expire. (Note 1)	<--	PDCCH (DCI 1_0): Short Message	-	-
4	The SS transmits a <i>Paging</i> message including a matched ng-5G-S-TMSI.	<--	NR RRC: <i>Paging</i>	-	-
5	Check: Does the UE transmit an <i>RRCSetupRequest</i> message with <i>establishmentCause</i> set to 'mt-access' ?	-->	NR RRC: <i>RRCSetupRequest</i>	1	P
6-12	Steps 3 to 9a1 of the generic test procedure in TS 38.508-1 [4] Table 4.9.4.2.2-1 are performed on NR Cell 1.	-	-	-	-
13	SS changes <i>SIB1</i> according to 38.508-1 [4] Table 4.6.1-28 and sends Short Message on PDCCH using P-RNTI. Wait for 2.1* modification period to allow the new system information to take effect.	<--	PDCCH (DCI 1_0): Short Message	-	-
14-15	Steps 1-2 of the NR RRC_CONNECTED procedure in table 4.5.4.2-3 in TS 38.508-1[4] are performed.	-	-	-	-
16	The SS responds with <i>RRCReject</i> message with IE <i>waitTime</i> set to 16s(T302).	<--	NR RRC: <i>RRCReject</i>	-	-
17	Make the UE attempt an emergency call dialling a number which is stored on the ME (e.g. 112 or 911), before the T302 timer expires.	-	-	-	-
18	Check: Does the UE transmit an <i>RRCSetupRequest</i> message with <i>establishmentCause</i> set to 'emergency' (Note 2)?	-->	NR RRC: <i>RRCSetupRequest</i>	3	P
19	The SS transmits an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>	-	-
20	The UE transmits an <i>RRCSetupComplete</i> message.	-->	NR RRC: <i>RRCSetupComplete</i>	-	-
21	SS transmits an <i>RRCRelease</i> message to release RRC connection and move the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-

Note 1: T390 is a random value between  $(0.7 + 0.6 \cdot 0) \cdot \text{uac-BarringTime}(4\text{s}) = 2.8\text{s}$  and  $(0.7 + 0.6 \cdot 1) \cdot \text{uac-BarringTime}(4\text{s}) = 5.2\text{s}$ , which will start after UE attempts an emergency call.

Note2: The emergency call dialling and UE *RRCsetupRequest* message should be initiated before T302 timer expires.

11.3.2.3.3 Specific message contents

Table 11.3.2.3.3-1: SIB1 for NR Cell 1 (Preamble, table 11.3.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	2		
uac-barringInfoSetIndex	1		
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00		
uac-BarringTime	s4		
uac-BarringForAccessIdentity	'0000000'B		
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			

Table 11.3.2.3.3-2: SIB1 for NR Cell 1 (Step3, Table 11.3.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition

SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	8 entries		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
UAC-BarringPerCat[2] SEQUENCE {		entry 2	
accessCategory	1		
uac-barringInfoSetIndex	1		
}			
UAC-BarringPerCat[3] SEQUENCE {		entry 3	
accessCategory	2		
uac-barringInfoSetIndex	1		
}			
UAC-BarringPerCat[4] SEQUENCE {		entry 4	
accessCategory	3		
uac-barringInfoSetIndex	1		
}			
UAC-BarringPerCat[5] SEQUENCE {		entry 5	
accessCategory	4		
uac-barringInfoSetIndex	1		
}			
UAC-BarringPerCat[6] SEQUENCE {		entry 6	
accessCategory	5		
uac-barringInfoSetIndex	1		
}			
UAC-BarringPerCat[7] SEQUENCE {		entry 7	
accessCategory	6		
uac-barringInfoSetIndex	1		
}			
UAC-BarringPerCat[8] SEQUENCE {		entry 8	
accessCategory	7		
uac-barringInfoSetIndex	1		
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList ::= SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00		
uac-BarringTime	s4		
uac-BarringForAccessIdentity	'0000000'B		
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			

Table 11.3.2.3.3-3: RRCReject (step 16, table 11.3.2.3.2-1)

Derivation path: TS 38.508-1 [4] Table 4.6.1-15			
Information Element	Value/remark	Comment	Condition
RRCReject ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReject SEQUENCE {			
waitTime	16	16 seconds	
}			
}			
}			

### 11.3.3 UAC / Access Identity 0 / AC8 / RRC\_INACTIVE / RNAUpdate/RRC Resume

#### 11.3.3.1 Test Purpose (TP)

(1)

with { UE not configured for special AIs (1,2,11-15) having received SIB1 indicating UAC info containing 0% accessibility for Access category 8 in NR RRC\_INACTIVE state }

```
ensure that {  
  when { RRC connection is to be resumed due to an RNA update with no emergency services ongoing }  
  then { UE resume attempt is barred and UE does not attempt the connection }  
}
```

(2)

with { SIB1 indicating UAC info containing 100% accessibility for Access category 8 in NR RRC\_INACTIVE state }

```
ensure that {  
  when { Access Barring is alleviated for Access Category 8 & upper layers do not request resumption of an RRC connection & variable pendingRnaUpdate is set to true }  
  then { UE initiates RRC connection resume procedure with resumeCause value set to rna-Update }  
}
```

#### 11.3.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331, clause 5.3.13.2, 5.3.13.8, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 38.331, clause 5.3.13.2]

The UE initiates the procedure when upper layers or AS (when responding to RAN paging or upon triggering RNA updates while the UE is in RRC\_INACTIVE) requests the resume of a suspended RRC connection.

The UE shall ensure having valid and up to date essential system information as specified in clause 5.2.2.2 before initiating this procedure.

Upon initiation of the procedure, the UE shall:

...

1> else if the resumption of the RRC connection is triggered due to an RNA update as specified in 5.3.13.8:

2> if an emergency service is ongoing:

NOTE: How the RRC layer in the UE is aware of an ongoing emergency service is up to UE implementation.

3> select '2' as the Access Category;

3> set the *resumeCause* to *emergency*;

- 2> else:
  - 3> select '8' as the Access Category;
- 2> perform the unified access control procedure as specified in 5.3.14 using the selected Access Category and one or more Access Identities to be applied as specified in TS 24.501 [23];
  - 3> if the access attempt is barred:
    - 4> set the variable *pendingRnaUpdate* to *true*;
    - 4> the procedure ends;

[TS 38.331, clause 5.3.13.8]

In RRC\_INACTIVE state, the UE shall:

- 1> if T380 expires; or
- 1> if RNA Update is triggered at reception of SIB1, as specified in 5.2.2.4.2:
  - 2> initiate RRC connection resume procedure in 5.3.13.2 with *resumeCause* set to *rna-Update*;
- 1> if barring is alleviated for Access Category '8', as specified in 5.3.14.4:
  - 2> if upper layers do not request RRC the resumption of an RRC connection, and
  - 2> if the variable *pendingRnaUpdate* is set to *true*:
    - 3> initiate RRC connection resume procedure in 5.3.13.2 with *resumeCause* value set to *rna-Update*.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
  - 2> consider the access attempt as barred;
- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:

...

- 3> else if SIB1 includes *uac-BarringForCommon*:
  - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
- 3> else:
  - 4> consider the access attempt as allowed;

- 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
  - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
    - 5> select the *UAC-BarringPerCat* entry;
    - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
      - 6> select the *UAC-BarringInfoSet* entry;
      - 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
    - 5> else:
      - 6> consider the access attempt as allowed;
  - 4> else:
    - 5> consider the access attempt as allowed;

[TS 38.331, clause 5.3.14.4]

The UE shall:

...

- 1> else if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running:
  - 2> consider the barring for this Access Category to be alleviated;

...

- 1> when barring for an Access Category is considered being alleviated:
  - 2> if the Access Category was informed to upper layers as barred:
    - 3> inform upper layers about barring alleviation for the Access Category.
  - 2> if barring is alleviated for Access Category '8':
    - 3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
  - 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to zero:
    - 2> consider the access attempt as allowed;
  - 1> else:
    - 2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;
    - 2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":

3> consider the access attempt as allowed;

2> else:

3> consider the access attempt as barred;

1> if the access attempt is considered as barred:

2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;

2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":

T390 = (0.7+ 0.6 \* *rand*) \* *uac-BarringTime*.

11.3.3.3

Test description

11.3.3.3.1

Pre-test conditions

System Simulator:

- NR Cell 1
- System information combination NR-1 as defined in TS 38.508-1 [4] clause 4.4.3.1.2 is used in NR cells.

UE:

- None.

Preamble:

- The UE is in state 2N-A on NR cell 1 according to TS 38.508-1 [4] Table 4.4A.2-2.

11.3.3.3.2

Test procedure sequence

Table 11.3.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Wait for 5 minute to make the timer T380 expire and trigger the RNA update procedure in UE.				
2	Check: Does the UE transmit an <i>RRCResumeRequest</i> message with resumeCause value set to rna-Update on NR Cell 1 within 60s?	-->	NR RRC: <i>RRCResumeRequest</i>	1	F
3	The SS changes the SIB1 according to 38.508-1 [4] Table 4.6.1-28 and transmits a Short message on PDCCH using P-RNTI indicating a systemInfoModification.	<--	PDCCH (DCI 1_0): Short Message	-	-
4	Check: Does the UE transmit an <i>RRCResumeRequest</i> message with resumeCause value set to rna-Update on NR Cell 1?	-->	NR RRC: <i>RRCResumeRequest</i>	2	P
5	The SS transmits an <i>RRCResume</i> message.	<--	NR RRC: <i>RRCResume</i>	-	-
6	The UE transmits an <i>RRCResumeComplete</i> message.	-->	NR RRC: <i>RRCResumeComplete</i>	-	-

11.3.3.3.3 Specific message contents

Table 11.3.3.3.3-1: *SIB1* for NR Cell 1 (preamble, Table 11.3.3.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	8		
uac-barringInfoSetIndex	1		
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00		
uac-BarringTime	s64		
uac-BarringForAccessIdentity	'0000000'B		
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			

Table 11.3.3.3.3-2: *RRCRelease* (preamble, Table 11.3.3.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-16			
Information Element	Value/remark	Comment	Condition



RRCRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcRelease SEQUENCE {			
suspendConfig SEQUENCE {			NR_RRC_I
t380	min5	5 minutes	NACTIVE
}			
}			
}			
}			

Table 11.3.3.3.3-3: *RRCResumeRequest* (step 2 and step 5, Table 11.3.3.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-19			
Information Element	Value/remark	Comment	Condition
RRCResumeRequest ::= SEQUENCE {			
rrcResumeRequest SEQUENCE {			
resumeCause	rna-Update		
}			
}			

### 11.3.4 UAC / Access Identity 0 / Registration procedure for mobility and periodic registration update / BarringPerPLMN/Implicit AC Barring List

#### 11.3.4.1 Test Purpose (TP)

(1)

with { UE in NR RRC\_IDLE not configured for special AIs (1,2,11-15) having received a SIB1 message including UAC set to 0% accessibility for Access Category 3 }

ensure that {

when { UE finds a new cell (AC 3) with SIB1 containing UAC Barring Info Per PLMN with Implicit AC Barring List }

then { UE does not access the new cell until access barring is alleviated }

}

#### 11.3.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clause 4.5.2, 4.5.4.1 and 5.5.1.3.7, TS 38.331 clause 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a) for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and
- b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration
0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
NOTE 1: Access identity 1 is valid when: - the USIM file EFUAC_AIC indicates the UE is configured for access identity 1 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or - the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when: - the USIM file EFUAC_AIC indicates the UE is configured for access identity 2 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or - the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).	

...

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
--------	------------------------	------------------------	-----------------

1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message	Access attempt is for MT access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b).the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call (NOTE 2)	4 (= MO MMTel voice)
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)
7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
9	UE NAS initiated 5GMM connection management procedure or 5GMM NAS transport procedure	Access attempt is for MO data	7 (= MO_data)
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".<			
NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service, or for			

	the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.
NOTE 3:	If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RLPMN or a PLMN equivalent to the RPLMN.
NOTE 4:	This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.
NOTE 5:	The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.
NOTE 6:	If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.
NOTE 7:	"EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.
NOTE 8:	For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

...

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];

- 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
- 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 5.5.1.3.7]

- b) The lower layers indicate that the access attempt is barred.

The UE shall not start the registration procedure for mobility and periodic registration update. The UE stays in the current serving cell and applies the normal cell reselection process.

The registration procedure for mobility and periodic registration update is started, if still needed, when the lower layers indicate that the barring is alleviated for the access category with which the access attempt was associated.

- ba) The lower layers indicate that access barring is applicable for all access categories except categories 0 and 2 and the access category with which the access attempt was associated is other than 0 and 2.

If the REGISTRATION REQUEST message has not been sent, the UE shall proceed as specified for case b. If the REGISTRATION REQUEST message has been sent, the UE shall proceed as specified for case e and, additionally, the registration procedure for mobility and periodic registration update is started, if still needed, when the lower layers indicate that the barring is alleviated for the access category with which the access attempt was associated. For additional UE requirements for both cases see subclause 4.5.5.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
  - 2> consider the access attempt as barred;

...

- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:

3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):

4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;

4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;

...

3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:

4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;

4> if the *uac-BarringInfoSetList* contains the *UAC-BarringInfoSet* entry corresponding to the selected *uac-BarringInfoSetIndex*:

5> select the *UAC-BarringInfoSet* entry;

5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";

4> else:

5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

3> if timer T302 is running:

4> if timer T390 is running for Access Category '2':

5> inform the upper layer that access barring is applicable for all access categories except categories '0', upon which the procedure ends;

4> else

5> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

- ...
- 1> else if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running:
- 2> consider the barring for this Access Category to be alleviated;
- ...
- 1> when barring for an Access Category is considered being alleviated:
- 2> if the Access Category was informed to upper layers as barred:
- 3> inform upper layers about barring alleviation for the Access Category.

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:
- 2> consider the access attempt as allowed;
- 1> else:
- 2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;
- 2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":
- 3> consider the access attempt as allowed;
- 2> else:
- 3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:
- 2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;
- 2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":
- $$T390 = (0.7 + 0.6 * rand) * uac-BarringTime.$$

11.3.4.3

Test description

11.3.4.3.1

Pre-test conditions

System Simulator:

- NR Cell 1 and NR Cell 11 have different tracking areas according to TS 38.508-1 [4] Table 4.4.2-3.
- System information combination NR-2 as defined in TS 38.508-1 [4] clause 4.4.3.1.2 is used in NR Cells.

UE:

- None.

Preamble:

- The UE is in state 1N-A on NR cell 1 according to TS 38.508-1 [4] Table 4.4A.2-1.

11.3.4.3.2 Test procedure sequence

Table 11.3.4.3.2-1/2 illustrate the downlink power levels and other changing parameters to be applied for the cell at various time instants of the test execution. The exact instants on which these values shall be applied are described in the texts in this clause. The configuration T0 indicates the initial conditions for preamble. Configurations marked "T1" is applied at the points indicated in the Main behaviour description in Table 11.3.4.3.2-3.

Table 11.3.4.3.2-1: Time instances of cell power level and parameter changes for FR1

	Parameter	Unit	NR Cell 1	NR Cell 11	Remark
T0	SS/PBCH SSS EPRE	dBm/ SCS	-88	Off	
T1	SS/PBCH SSS EPRE	dBm/ SCS	-88	-80	The power level values are assigned to satisfy $R_{NRCell\ 1} < R_{NRCell\ 11}$

Table 11.3.4.3.2-2: Time instances of cell power level and parameter changes for FR2

	Parameter	Unit	NR Cell 1	NR Cell 11	Remark
T0	SS/PBCH SSS EPRE	dBm/ SCS	-91	Off	
T1	SS/PBCH SSS EPRE	dBm/ SCS	-91	-82	The power level values are assigned to satisfy $R_{NRCell\ 1} < R_{NRCell\ 11}$

Table 11.3.4.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		



1	The SS changes the SIB1 of NR Cell 11 according to Table 11.3.4.3.3-1				
2	The SS adjusts the SS/PBCH EPRE levels and according to row "T1" in table 11.3.4.3.2-1/2.	-	-	-	-
3	Wait for 34s for FR1 or 130s for FR2 to allow UE to recognise the change.(Note 1)				
4	Check: Does the UE transmit an RRCSetupRequest message on NR cell 11?	-->	NR RRC: RRCSetupRequest	1	F
5	The SS changes the SIB1 according to 38.508-1 [4] Table 4.6.1-28 and transmits a Short message on PDCCH using P-RNTI indicating a systemInfoModification.	<--	PDCCH (DCI 1_0): Short Message	-	-
6	Wait for 1 second for the UE to receive the modified system information.				
7	Wait for 84s for T390 to expire. (Note 2)				
8	Check: Does UE transmit RRCSetupRequest message on NR cell 11?	-->	NR RRC: RRCSetupRequest	1	P
912	Steps 2 to 5 of the generic test procedure in TS 38.508-1 Table 4.9.5.2.2-1 with condition MOBILITY are performed on NR cell 11. NOTE: The UE performs a " REGISTRATION REQUEST procedure with type "mobility registration updating" .	-	-	-	-
Note 1: The wait time for reselection to a newly detected intra frequency cell is selected to cover $T_{\text{detect,NR\_Intra}}$ ( $25 \times 1280\text{ms} = 32\text{s}$ for FR1 and $25 \times 4 \times 1280\text{ms} = 128\text{s}$ for FR2) + $T_{\text{SI-NR}}$ (1.28s for FR1 and FR2) = 33.28s rounded up to 34s for FR1 and 129.28s rounded up to 130s for FR2. Note 2: T390 timer value is derived from 38.331[12] $T390 = (0.7 + 0.6 \times \text{rand}) \times \text{uac-BarringTime}$ where the uac-BarringTime value of 64s is provided in 38.523 Table 11.3.4.3.3-1 and where the value of rand is chosen to be 1 as to arrive at the maximum value for T390 of 83.2s rounded up to 84s					

11.3.4.3.3

Specific message contents

Table 11.3.4.3.3-1: SIB1 for NR Cell 11 (step 1, Table 11.3.4.3.3-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition

SIB1 ::= SEQUENCE {			
cellAccessRelatedInfo SEQUENCE {			
PLMN-IdentityInfoList SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-IdentityInfo {	1 entry		
PLMN-IdentityInfo[1] SEQUENCE {		entry 1	
plmn-IdentityList SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity {	1 entry		
plmn-Identity[1]		entry 1 PLMN ID of NR Cell 11	
}			
}			
}			
}			
}			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon	Not present		
uac-BarringPerPLMN-List SEQUENCE (SIZE (1..maxPLMN)) OF UAC-BarringPerPLMN {			
UAC-BarringPerPLMN SEQUENCE {			
plmn-IdentityIndex	1		
uac-ACBarringListType CHOICE {			
uac-ImplicitACBarringList SEQUENCE (SIZE(maxAccessCat-1)) OF UAC-BarringInfoSetIndex {	63 entries		
UAC-BarringInfoSetIndex[1]	2	entry 1	
UAC-BarringInfoSetIndex[2]	2	entry 2	
UAC-BarringInfoSetIndex[3]	1	entry 3	
UAC-BarringInfoSetIndex[4]	2	entry 4	
UAC-BarringInfoSetIndex[5]	2	entry 5	
UAC-BarringInfoSetIndex[6]	2	entry 6	
UAC-BarringInfoSetIndex[7]	2	entry 7	
UAC-BarringInfoSetIndex[8]	2	entry 8	
UAC-BarringInfoSetIndex[9]	2	entry 9	
UAC-BarringInfoSetIndex[10]	2	entry 10	
UAC-BarringInfoSetIndex[11]	2	entry 11	
UAC-BarringInfoSetIndex[12]	2	entry 12	
UAC-BarringInfoSetIndex[13]	2	entry 13	
UAC-BarringInfoSetIndex[14]	2	entry 14	
UAC-BarringInfoSetIndex[15]	2	entry 15	
UAC-BarringInfoSetIndex[16]	2	entry 16	
UAC-BarringInfoSetIndex[17]	2	entry 17	
UAC-BarringInfoSetIndex[18]	2	entry 18	
UAC-BarringInfoSetIndex[19]	2	entry 19	
UAC-BarringInfoSetIndex[20]	2	entry 20	
UAC-BarringInfoSetIndex[21]	2	entry 21	
UAC-BarringInfoSetIndex[22]	2	entry 22	
UAC-BarringInfoSetIndex[23]	2	entry 23	
UAC-BarringInfoSetIndex[24]	2	entry 24	
UAC-BarringInfoSetIndex[25]	2	entry 25	
UAC-BarringInfoSetIndex[26]	2	entry 26	
UAC-BarringInfoSetIndex[27]	2	entry 27	
UAC-BarringInfoSetIndex[28]	2	entry 28	
UAC-BarringInfoSetIndex[29]	2	entry 29	
UAC-BarringInfoSetIndex[30]	2	entry 30	
UAC-BarringInfoSetIndex[31]	2	entry 31	
UAC-BarringInfoSetIndex[32]	2	entry 32	
UAC-BarringInfoSetIndex[33]	2	entry 33	
UAC-BarringInfoSetIndex[34]	2	entry 34	
UAC-BarringInfoSetIndex[35]	2	entry 35	
UAC-BarringInfoSetIndex[36]	2	entry 36	
UAC-BarringInfoSetIndex[37]	2	entry 37	
UAC-BarringInfoSetIndex[38]	2	entry 38	
UAC-BarringInfoSetIndex[39]	2	entry 39	
UAC-BarringInfoSetIndex[40]	2	entry 40	
UAC-BarringInfoSetIndex[41]	2	entry 41	

UAC-BarringInfoSetIndex[42]	2	entry 42	
UAC-BarringInfoSetIndex[43]	2	entry 43	
UAC-BarringInfoSetIndex[44]	2	entry 44	
UAC-BarringInfoSetIndex[45]	2	entry 45	
UAC-BarringInfoSetIndex[46]	2	entry 46	
UAC-BarringInfoSetIndex[47]	2	entry 47	
UAC-BarringInfoSetIndex[48]	2	entry 48	
UAC-BarringInfoSetIndex[49]	2	entry 49	
UAC-BarringInfoSetIndex[50]	2	entry 50	
UAC-BarringInfoSetIndex[51]	2	entry 51	
UAC-BarringInfoSetIndex[52]	2	entry 52	
UAC-BarringInfoSetIndex[53]	2	entry 53	
UAC-BarringInfoSetIndex[54]	2	entry 54	
UAC-BarringInfoSetIndex[55]	2	entry 55	
UAC-BarringInfoSetIndex[56]	2	entry 56	
UAC-BarringInfoSetIndex[57]	2	entry 57	
UAC-BarringInfoSetIndex[58]	2	entry 58	
UAC-BarringInfoSetIndex[59]	2	entry 59	
UAC-BarringInfoSetIndex[60]	2	entry 60	
UAC-BarringInfoSetIndex[61]	2	entry 61	
UAC-BarringInfoSetIndex[62]	2	entry 62	
UAC-BarringInfoSetIndex[63]	2	entry 63	
}			
}			
}			
}			
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00		
uac-BarringTime	s64		
uac-BarringForAccessIdentity	'0000000'B		
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			
Note : UAC-BarringInfoSetIndex value 2 referring to an entry not included in uac-BarringInfoSetList indicates no barring for the Access Category.			

11.3.5 UAC / Access Identity 1 / New cell not in the country of its HPLMN/EHPLMN 0% access probability/MPS indicator / HPLMN/0%/100% accessibility AC5/MMTEL-Video call

11.3.5.1 Test Purpose (TP)

(1)

```
with { UE configured for Access Identity 1 }

ensure that {

    when { UE moves to a new cell which is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present) having received SIB1 message including UAC set to 0% accessibility for Access Identity 1 }

    then { UE does not consider Access Identity 1 as valid and continues with the REGISTRATION procedure }

}
```

(2)

```
with { UE configured for Access Identity 1 }

ensure that {

    when { UE moves to a new cell which is not in the country of its HPLMN or in an EHPLMN (if the
EHPLMN list is present) but receives the MPS indicator bit of the 5GS network feature support IE in
the REGISTRATION ACCEPT message being set to ""Access identity 1 valid"" }

        then { UE does consider Access Identity 1 as valid }

    }
```

(3)

```
with { UE configured for Access Identity 1 having received SIB1 containing UAC Barring Info
indicating 0% accessibility for Access Category 5 in NR RRC_IDLE state on HPLMN }

ensure that {

    when { User initiates MMTEL-Video call }

        then { UE does not attempt to initiate connection on the NR Cell }

    }
```

(4)

```
with { UE configured for Access Identity 1 having received SIB1 containing UAC Info indicating 100%
accessibility for Access Category 5 while camped on HPLMN in NR RRC_IDLE state }

ensure that {

    when { User initiates MMTEL-Video call and Access Barring check indicates Barring is alleviated }

        then { UE initiates RRC Connection Setup procedure with establishmentCause set to mps-
PriorityAccess }

    }
```

11.3.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in TS 24.501: clause 4.5.2, 4.5.4.1 and 4.5.6 and TS 38.331: clause 5.3.14.1, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a) for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and
- b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration
0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
NOTE 1: Access identity 1 is valid when: - the USIM file EFUAC_AIC indicates the UE is configured for access identity 1 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or - the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when: - the USIM file EFUAC_AIC indicates the UE is configured for access identity 2 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or - the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).	

The UE uses the MPS indicator bit of the 5GS network feature support IE to determine if access identity 1 is valid. Processing of the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 1 to be valid when the UE is not in the country of its HPLMN prior to receiving the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 1 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 1 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 1, the UE uses the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 1 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 1, the MPS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

The UE uses the MCS indicator bit of the 5GS network feature support IE to determine if access identity 2 is valid. Processing of the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 2 to be valid when

the UE is not in the country of its HPLMN prior to receiving the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 2 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 2, the UE uses the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 2 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 2, the MCS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message	Access attempt is for MT access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b).the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call	4 (= MO MMTel voice)

		(NOTE 2)	
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)
7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
9	UE NAS initiated 5GMM connection management procedure or 5GMM NAS transport procedure	Access attempt is for MO data	7 (= MO_data)
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
<p>NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".&lt;</p> <p>NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.</p> <p>NOTE 3: If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RPLMN or a PLMN equivalent to the RPLMN.</p> <p>NOTE 4: This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.</p> <p>NOTE 5: The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.</p> <p>NOTE 6: If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.</p> <p>NOTE 7: "EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.</p> <p>NOTE 8: For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).</p>			

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.5.6]

When 5GMM requests the establishment of a NAS-signalling connection, the RRC establishment cause used by the UE shall be selected according to one or more access identities (see subclause 4.5.2) and the determined access category as



specified in table 4.5.6.1 and table 4.5.6.2. If the determined access category is an operator-defined access category, then the RRC establishment cause used by the UE shall be selected according to table 4.5.6.1 and table 4.5.6.2 based on one or more access identities (see subclause 4.5.2) and the standardized access category determined for the operator-defined access category as described in subclause 4.5.3.

**Table 4.5.6.1: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via NR connected to 5GCN**

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VideoCall
	6 (= MO SMS and SMSoIP)	mo-SMS
	7 (= MO_data)	mo-Data
1	Any category	mps-PriorityAccess
2	Any category	mcs-PriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

**Table 4.5.6.2: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via E-UTRA connected to 5GCN**

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VoiceCall
	6 (= MO SMS and SMSoIP)	mo-Data
	7 (= MO_data)	mo-Data
1	Any category	highPriorityAccess
2	Any category	highPriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

[TS 38.331, clause 5.3.14.1]

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a handover resulting in change of PCell in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SIB1*) from the target cell.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
  - 2> consider the access attempt as barred;
- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):
      - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;
      - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
    - 3> else if *SIB1* includes *uac-BarringForCommon*:
      - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
    - 3> else:
      - 4> consider the access attempt as allowed;
    - 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
      - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
        - 5> select the *UAC-BarringPerCat* entry;
        - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
          - 6> select the *UAC-BarringInfoSet* entry;
          - 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
        - 5> else:
          - 6> consider the access attempt as allowed;
      - 4> else:
        - 5> consider the access attempt as allowed;

3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:

4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;

4> if the *uac-BarringInfoSetList* contains the *UAC-BarringInfoSet* entry corresponding to the selected *uac-BarringInfoSetIndex*:

5> select the *UAC-BarringInfoSet* entry;

5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";

4> else:

5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

3> if timer T302 is running:

4> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

1> if timer T302 expires or is stopped, and if timer T390 corresponding to an Access Category is not running; or

1> if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running; or

1> if timer T390 corresponding to the Access Category '2' expires or is stopped:

2> consider the barring for this Access Category to be alleviated;

1> when barring for an Access Category is considered being alleviated:

2> if the Access Category was informed to upper layers as barred:

3> inform upper layers about barring alleviation for the Access Category.

- 2> if barring is alleviated for Access Category '8':
- 3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:
- 2> consider the access attempt as allowed;
- 1> else:
- 2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;
- 2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":
- 3> consider the access attempt as allowed;
- 2> else:
- 3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:
- 2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;
- 2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":
- T390 = (0.7+ 0.6 \* *rand*) \* *uac-BarringTime*.

11.3.5.3                    Test description

11.3.5.3.1                Pre-test conditions

System Simulator:

- 2 NR cells: NR Cell 1 and 12 as specified in TS 38.508-1 [4] table 4.4.2-3 are configured as shown in Table 11.3.5.3.1–1.

Table 11.3.5.3.1–1: PLMN identifiers

NR Cell	PLMN names	MCC	MNC
NR Cell 1	PLMN1	001	01
NR Cell 12	PLMN2	002	11

- System information combination NR-1 as defined in TS 38.508-1 [4] Table 4.4.3.1.2-1 is used in NR cells.

UE:

- The UE is equipped with a USIM configuration as defined in TS 38.508-1 [4] Table FFS.

Preamble:

- The UE is in state 1N-A on NR Cell 1(serving cell) according to TS 38.508-1 [4] Table 4.4A.2-1 and using the message condition UE TEST LOOP MODE B active with IP PDU delay = 1 second according to TS 38.508-1 [4].

11.3.5.3.2 Test procedure sequence

Table 11.3.5.3.2-1 for FR1 and Table 11.3.5.3.2-2 for FR2 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Row marked "T0" denotes the initial conditions in preamble, while columns marked "T1", "T2" and "T3" are to be applied subsequently in the Main behaviour. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 11.3.5.3.2-1: Time instances of cell power level and parameter changes for FR1

	Parameter	Unit	NR Cell 1	NR Cell 12	Remarks
T0	SS/PBCH SSS EPRE	dBm/SCS	-88	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
T1	SS/PBCH SSS EPRE	dBm/SCS	Off	-80	The power level values are assigned to ensure UE registered on NR Cell 12.
T2	SS/PBCH SSS EPRE	dBm/SCS	-80	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
Note 1: Power level “Off” is defined in TS 38.508-1 [4] Table 6.2.2.1-3.					

Table 11.3.5.3.2-2: Time instances of cell power level and parameter changes for FR2

	Parameter	Unit	NR Cell 1	NR Cell 12	Remarks
T0	SS/PBCH SSS EPRE	dBm/SCS	FFS	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
T1	SS/PBCH SSS EPRE	dBm/SCS	Off	FFS	The power level values are assigned to ensure UE registered on NR Cell 12.
T2	SS/PBCH SSS EPRE	dBm/SCS	FFS	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
Note 1: Power level “Off” is defined in TS 38.508-1 [4] Table 6.2.2.2-2.					

Table 11.3.5.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS adjusts the NR Cells power levels according to row "T1" in table 11.3.5.3.2-1/2.	-	-	-	-
2	The UE transmits <i>RRCSetupRequest</i> message within 10 s on NR cell 12. Check: Does the <i>RRCSetupRequest</i> message includes the <i>establishmentCause</i> which is any	-->	NR RRC: <i>RRCSetupRequest</i>	1	P

	value except <i>mps-PriorityAccess</i> ?				
3-6	Steps 2 to 5 of the mobility registration updating procedure described in TS 38.508-1 [4] Table 4.9.5.2.2-1 are performed on NR Cell 12. (Note 1)	-	-	-	-
7-10	Steps 5 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are performed.	-	-	-	-
11	SS changes SIB1 of NR Cell 12 according to Table 11.3.1.3.3-2 and send Short Message on PDCCH using P-RNTI. Wait for 2.1* modification period to allow the new system information to take effect.	<--	PDCCH (DCI 1_0): Short Message	-	-
12	The SS transmits one IP PDU.	-	-	-	-
13	The SS transmits an <i>RRCRelease</i> message and move the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-
14	Check: Does the UE transmit a <i>RRCSetupRequest</i> message including establishmentCause equal to <i>mps-PriorityAccess</i> within 10 s?.	-->	NR RRC: <i>RRCSetupRequest</i>	2	P
15-20	Steps 3 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 [4] Table 4.5.4.2-3 are performed.	-	-	-	-
21	The UE loop back the IP PDU.	-	-	-	-
22	The SS transmits DEACTIVATE TEST MODE message.	<--	DEACTIVATE TEST MODE	-	-
23	The UE transmits DEACTIVATE TEST MODE COMPLETE message.	-->	DEACTIVATE TEST MODE COMPLETE	-	-
24	The SS transmits an <i>RRCRelease</i> message to release RRC connection and moves the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-
25	The SS adjusts the NR Cells power levels according to row "T2" in table 11.3.5.3.2-1/2.	-	-	-	-
26	SS changes SIB1 of NR cell 1 according to Table 11.3.5.3.3-1 and notifies the UE of change of System Information on NR Cell 1 by send Short Message on PDCCH using P-RNTI.	<--	PDCCH (DCI 1_0): Short Message	-	-
27-32a 1	Steps 1 to 6 of the mobility registration updating procedure described in TS 38.508-1 [4] Table 4.9.5.2.2-1 are performed on NR Cell 1. (Note 2)	-	-	-	-
33	AT command to make the UE attempt MMTEL-Video call.	-	-	-	-
34	Check: Does the UE transmit a <i>RRCSetupRequest</i> message including establishmentCause equal to <i>mps-PriorityAccess</i> within 6 s?	-->	NR RRC: <i>RRCSetupRequest</i>	3	F
35	SS changes SIB1 of NR cell 1 according to Table 11.3.5.3.3-1 and notifies the UE of change of System Information on NR Cell 1 by send Short Message on PDCCH using P-RNTI.	<--	PDCCH (DCI 1_0): Short Message	-	-
36	Wait for 2.1* modification period to allow the new system information to take effect.	-	-	-	-
37	Make the UE attempt another MMTEL-Video call.	-	-	-	-
38	Check: Does the UE transmit a <i>RRCSetupRequest</i> message including establishmentCause equal to <i>mps-PriorityAccess</i> within 10 s?.	-->	NR RRC: <i>RRCSetupRequest</i>	4	P
39-44	Steps 3-8 of expected sequence from Table 4.5.4.2-3 as defined in 38.508-1 [4] is performed.	-	-	-	-
-	EXCEPTION: In parallel to the events described	-	-	-	-

	in steps 42-44 below the events specified in steps FFS of the expected sequence defined in annex FFS of 34.229-5 [41] takes place. Editor's Note: generic procedure to be provided in TS 34.229-5				
45	The SS transmits an RRCReconfiguration message and an PDU SESSION MODIFICATION COMMAND	<--	NR RRC: RRCReconfiguration 5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION MODIFICATION COMMAND	-	-
46	The UE transmits an RRCReconfigurationComplete message	-->	NR RRC: RRCReconfigurationComplete	-	-
47	Check: Does the UE transmit a ULInformationTransfer message, an UL NAS TRANSPORT message and an PDU SESSION MODIFICATION COMPLETE message?	-->	NR RRC: ULInformationTransfer 5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION MODIFICATION COMPLETE	-	-
48	UE is triggered by MMI to release the call.	-	-	-	-
49	The Generic test procedure for MO Release of Voice Call / 5GS as specified in Annex A.7 of TS 34.229-5 [41] takes place. Editor's Note: we should also depict the lower layers here that than might call 34.229-5.	-	-	-	-
Note 1: The SS includes a 5GS network feature support IE in the REGISTRATION ACCEPT message configured as Table 11.3.5.3.3-3.					
Note 2: The UE performs mobility registration updating procedure and the RRC connection is released.					

Editor's Note: Test Procedures for IMS MO Video call establishment in 5GC are FFS.

11.3.5.3.3 Specific message contents

Table 11.3.5.3.3-1: SIB1 of NR Cell 1 (Preamble, step 26 and step 32 , Table 11.3.5.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE { uac-BarringInfo SEQUENCE {			Preamble and step 26
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC- BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	5	(= MO MMTel video)	
uac-barringInfoSetIndex	1	Value 1 corresponds to the first entry in uac-BarringInfoSetList	
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC- BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00	0% access probability	
uac-BarringTime	s16	16 s	
uac-BarringForAccessIdentity	'111111'B	Value 1 means that access attempt is not allowed for the corresponding access identity.	

		The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1.	
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
uac-BarringInfo	Not present		Step 35
}			

Table 11.3.5.3.3-2: SIB1 of NR Cell 12 (Step 1 and step 11, Table 11.3.5.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			Step 1
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	3	(= MO_sig)	
uac-barringInfoSetIndex	1	Value 1 corresponds to the first entry in uac-BarringInfoSetList	
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00	0% access probability	
uac-BarringTime	s16	16 s	
uac-BarringForAccessIdentity	'1111111'B	Value 1 means that access attempt is not allowed for the corresponding access identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1.	
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
uac-BarringInfo	Not present		Step 11
}			

Table 11.3.5.3.3-3: REGISTRATION ACCEPT(step 5, Table 11.3.5.3.2-3)

Derivation path: TS 38.508 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition



5GS network feature support	'1000 0001 0000 0000'B	Access identity 1 valid in RPLMN or equivalent PLMN. IMS voice over PS session supported over 3GPP access. All other features set to "not supported" including the 'Interworking without N26 interface not supported'.	
-----------------------------	------------------------	--	--

11.3.6 UAC / Access Identity 2 / New cell not in the country of its HPLMN/EHPLMN 0% access probability/MCS indicator / HPLMN/0%/100% accessibility AC7/RRC\_INACTIVE

11.3.6.1 Test Purpose (TP)

(1)

with { UE configured for Access Identity 2 }

ensure that {

    when { UE moves to a new cell which is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present) having received SIB1 message including UAC set to 0% accessibility for Access Identity 2 }

    then { UE does not consider Access Identity 2 as valid and continues with the REGISTRATION procedure }

    }

(2)

with { UE configured for Access Identity 2 }

ensure that {

    when { UE moves to a new cell which is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present) but receives the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid" }

    then { UE does consider Access Identity 2 as valid }

    }

(3)

with { UE configured for Access Identity 2 having received SIB1 containing UAC Info indicating 0% accessibility for Access Category 7 camped in NR RRC\_INACTIVE state on HPLMN }

ensure that {

```
when { UE attempts to send uplink user data packet for a PDU session with suspended user-plane
resources }

then { UE does not attempt to initiate connection on the NR Cell until barring is alleviated }
```

(4)

```
with { UE configured for Access Identity 2 having received SIB1 containing UAC Info indicating 100%
accessibility for Access Category 7 while camped on HPLMN in NR RRC_INACTIVE state }

ensure that {

when { UE attempts to send uplink user data packet for a PDU session with suspended user-plane
resources }

then { UE initiates RRC Resume procedure with establishmentCause set to mcs-PriorityAccess }

}
```

11.3.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in TS 24.501: clause 4.5.2, 4.5.4.1 and 4.5.6 and TS 38.331: clause 5.3.14.1, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a) for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and
- b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration

0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
NOTE 1: Access identity 1 is valid when: - the USIM file EF <sub>UAC_AIC</sub> indicates the UE is configured for access identity 1 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or - the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when: - the USIM file EF <sub>UAC_AIC</sub> indicates the UE is configured for access identity 2 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or - the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).	

The UE uses the MPS indicator bit of the 5GS network feature support IE to determine if access identity 1 is valid. Processing of the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 1 to be valid when the UE is not in the country of its HPLMN prior to receiving the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 1 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 1 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 1, the UE uses the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 1 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 1, the MPS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

The UE uses the MCS indicator bit of the 5GS network feature support IE to determine if access identity 2 is valid. Processing of the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 2 to be valid when the UE is not in the country of its HPLMN prior to receiving the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 2 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 2, the UE uses the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 2 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 2, the MCS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message	Access attempt is for MT access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b).the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call (NOTE 2)	4 (= MO MMTel voice)
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)
7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
9	UE NAS initiated 5GMM	Access attempt is for MO data	7 (= MO_data)

	connection management procedure or 5GMM NAS transport procedure		
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
<p>NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".&lt;</p> <p>NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.</p> <p>NOTE 3: If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RLPMN or a PLMN equivalent to the RPLMN.</p> <p>NOTE 4: This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.</p> <p>NOTE 5: The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.</p> <p>NOTE 6: If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.</p> <p>NOTE 7: "EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.</p> <p>NOTE 8: For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).</p>			

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.5.6]

When 5GMM requests the establishment of a NAS-signalling connection, the RRC establishment cause used by the UE shall be selected according to one or more access identities (see subclause 4.5.2) and the determined access category as specified in table 4.5.6.1 and table 4.5.6.2. If the determined access category is an operator-defined access category, then the RRC establishment cause used by the UE shall be selected according to table 4.5.6.1 and table 4.5.6.2 based on one or more access identities (see subclause 4.5.2) and the standardized access category determined for the operator-defined access category as described in subclause 4.5.3.

Table 4.5.6.1: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via NR connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VideoCall
	6 (= MO SMS and SMSoIP)	mo-SMS
	7 (= MO_data)	mo-Data
1	Any category	mps-PriorityAccess
2	Any category	mcs-PriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

Table 4.5.6.2: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via E-UTRA connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VoiceCall
	6 (= MO SMS and SMSoIP)	mo-Data
	7 (= MO_data)	mo-Data
1	Any category	highPriorityAccess
2	Any category	highPriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

[TS 38.331, clause 5.3.14.1]

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a handover resulting in change of PCell in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SIB1*) from the target cell.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
- 2> consider the access attempt as barred;

- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):
      - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;
      - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
    - 3> else if *SIB1* includes *uac-BarringForCommon*:
      - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
    - 3> else:
      - 4> consider the access attempt as allowed;
    - 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
      - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
        - 5> select the *UAC-BarringPerCat* entry;
        - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
          - 6> select the *UAC-BarringInfoSet* entry;
          - 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
      - 5> else:
        - 6> consider the access attempt as allowed;
    - 4> else:
      - 5> consider the access attempt as allowed;
    - 3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:
      - 4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;



4> if the uac-BarringInfoSetList contains the UAC-BarringInfoSet entry corresponding to the selected uac-BarringInfoSetIndex:

5> select the *UAC-BarringInfoSet* entry;

5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";

4> else:

5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

3> if timer T302 is running:

4> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

1> if timer T302 expires or is stopped, and if timer T390 corresponding to an Access Category is not running; or

1> if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running; or

1> if timer T390 corresponding to the Access Category '2' expires or is stopped:

2> consider the barring for this Access Category to be alleviated;

1> when barring for an Access Category is considered being alleviated:

2> if the Access Category was informed to upper layers as barred:

3> inform upper layers about barring alleviation for the Access Category.

2> if barring is alleviated for Access Category '8':

3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:
- 2> consider the access attempt as allowed;
- 1> else:
- 2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;
- 2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":
- 3> consider the access attempt as allowed;
- 2> else:
- 3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:
- 2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;
- 2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":
- T390 = (0.7+ 0.6 \* *rand*) \* *uac-BarringTime*.

11.3.6.3                    Test description

11.3.6.3.1                Pre-test conditions

System Simulator:

- 2 NR cells: NR Cell 1 and 12 as specified in TS 38.508-1[4] table 4.4.2-3 are configured as shown in Table 11.3.6.3.1–1.

Table 11.3.6.3.1–1: PLMN identifiers

NR Cell	PLMN names	MCC	MNC
NR Cell 1	PLMN1	001	01
NR Cell 12	PLMN2	002	11

- System information combination NR-1 as defined in TS 38.508-1 [4] Table 4.4.3.1.2-1 is used in NR cells.

UE:

- The UE is equipped with a USIM configuration as defined in TS 38.508-1 [4] Table 6.4.1-19.

Preamble:

- The UE is in state 1N-A on NR Cell 1(serving cell) according to TS 38.508-1 [4] Table 4.4A.2-1 and using the message condition UE TEST LOOP MODE B active with IP PDU delay = 1 second according to TS 38.508-1 [4].

11.3.6.3.2 Test procedure sequence

Table 11.3.6.3.2-1 for FR1 and Table 11.3.6.3.2-2 for FR2 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Row marked "T0" denotes the initial conditions in preamble, while columns marked "T1", "T2" and "T3" are to be applied subsequently in the Main behaviour. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 11.3.6.3.2-1: Cell configuration changes over time for FR1

	Parameter	Unit	NR Cell 1	NR Cell 12	Remarks
T0	SS/PBCH SSS EPRE	dBm/SCS	-88	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
T1	SS/PBCH SSS EPRE	dBm/SCS	Off	-80	The power level values are assigned to ensure UE registered on NR Cell 12.
T2	SS/PBCH SSS EPRE	dBm/SCS	-80	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
Note 1: Power level "Off" is defined in TS 38.508-1 [4] Table 6.2.2.1-3.					

Table 11.3.6.3.2-2: Cell configuration changes over time for FR2

	Parameter	Unit	NR Cell 1	NR Cell 12	Remarks
T0	SS/PBCH SSS EPRE	dBm/SCS	FFS	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
T1	SS/PBCH SSS EPRE	dBm/SCS	Off	FFS	The power level values are assigned to ensure UE registered on NR Cell 12.
T2	SS/PBCH SSS EPRE	dBm/SCS	FFS	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
Note 1: Power level "Off" is defined in TS 38.508-1 [4] Table 6.2.2.2-2.					

Table 11.3.6.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS adjusts the NR Cells power levels according to row "T1" in table 11.3.6.3.2-1/2.	-	-	-	-
2	The UE transmit a <i>RRCSetupRequest</i> message within 10 s on NR cell 12. Check: Does the <i>RRCSetupRequest</i> message include the <i>establishmentCause</i> which is any value except <i>mcs-PriorityAccess</i> ?	-->	NR RRC: <i>RRCSetupRequest</i>	1	P
3-6	Steps 2 to 5 of the mobility registration updating procedure described in TS 38.508-1 [4] Table 4.9.5.2.2-1 are performed on NR Cell 12. (Note 1)	-	-	-	-
6A-6D	Steps 5 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
7	The SS transmits one IP PDU.	-	-	-	-
8	The SS transmits an <i>RRCRelease</i> message and move the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-
9	Check: Does the UE transmit a <i>RRCSetupRequest</i> message including <i>establishmentCause</i> of <i>mcs-PriorityAccess</i> within 10 s?	-->	NR RRC: <i>RRCSetupRequest</i>	2	P
10	SS transmit an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>	-	-

11	The UE transmits an <i>RRCSetupComplete</i> message to confirm the successful completion of the connection establishment.	-->	NR RRC: <i>RRCSetupComplete</i> 5GMM: SERVICE REQUEST	-	-
11 A- 11 D	Steps 5 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
12	The UE loops back the IP PDU.	-	-	-	-
13	The SS transmits an <i>RRCRelease</i> message to release RRC connection and move the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-
14	The SS changes the SIB1 of NR Cell 1 to set the uac-BarringInfo and adjusts the NR Cells power levels according to row "T2" in table 11.3.6.3.2-1/2.	-	-	-	-
15- 19	Steps 1 to 5 of the mobility registration updating procedure described in TS 38.508-1 [4] Table 4.9.5.2.2-1 are performed on NR Cell 1. (Note 2)	-	-	-	-
19 A- 19 D	Steps 5 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
20	The SS transmits one IP PDU.	-	-	-	-
21	The SS transmits an <i>RRCRelease</i> message with suspend configuration and move the UE to RRC_INACTIVE.	<--	NR RRC: <i>RRCRelease</i>	-	-
22	Check: Does the UE transmit a <i>RRCResumeRequest</i> message including <i>resumeCause</i> of <i>mcs-PriorityAccess</i> within 10 s? (Note 4)	-->	NR RRC: <i>RRCResumeRequest</i>	3	F
23	SS changes SIB1 according to Table 11.3.6.3.3-5. And the SS notifies the UE of change of System Information on NR Cell 1 by send Short Message on PDCCH using P-RNTI.	<--	NR RRC: <i>Paging</i>	-	-
24	Check: Does the UE transmit a <i>RRCResumeRequest</i> message including <i>resumeCause</i> of <i>mcs-PriorityAccess</i> within 30 s? (Note 3)	-->	NR RRC: <i>RRCResumeRequest</i>	4	P
25	SS transmit an <i>RRCResume</i> message.	<--	NR RRC: <i>RRCResume</i>	-	-
26	The UE transmits an <i>RRCResumeComplete</i> message to confirm the successful completion of the connection establishment.	-->	NR RRC: <i>RRCResumeComplete</i>	-	-
27	The UE loops back the IP PDU.	-	-	-	-
28	The SS transmits an <i>RRCRelease</i> message to release RRC connection and move the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-
Note 1: The SS includes a 5GS network feature support IE in the REGISTRATION ACCEPT message configured as Table 11.3.6.3.3-3. Note 2: The UE performs registration and the RRC connection is released. Note 3: The wait time 30s is selected to cover $(0.7 + 0.6 * rand) * uac-BarringTime(16s) = 20.8s + 1s$ (IP PDU delay timer) + 5.12s (modification period) = 26.92s rounded up to 27s when 'rand' takes the maximum value of 1. Note 4: The wait time 10s is selected to be less than T390 minimum = $(0.7 + 0.6 * rand) * uac-BarringTime(16s) = 11.2s$ when 'rand' takes the minimum value of 0.					

11.3.6.3.3 Specific message contents

Table 11.3.6.3.3-1: SIB1 of NR Cell 12 (preamble and all steps, Table 11.3.6.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28

Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	3	(= MO_sig)	
uac-barringInfoSetIndex	1	Value 1 corresponds to the first entry in uac-BarringInfoSetList	
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00	0% access probability	
uac-BarringTime	s16	16 s	
uac-BarringForAccessIdentity	'1111111'B	Value 1 means that access attempt is not allowed for the corresponding access identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1.	
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not present		
}			
}			

Table 11.3.6.3.3-2: RRCSetupRequest (step 2 and step 9, Table 11.3.6.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-23:			
Information Element	Value/remark	Comment	Condition
RRCSetupRequest ::= SEQUENCE {			
rrcSetupRequest SEQUENCE {			
establishmentCause	Any allowed value other than mcs-PriorityAccess		Step 2
	mcs-PriorityAccess		Step 9
}			
}			

Table 11.3.6.3.3-3: REGISTRATION ACCEPT(step 5, Table 11.3.6.3.2-3)

Derivation path: TS 38.508 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

5GS network feature support	'0000 0001 0000 0010'B	Access identity 2 valid in RPLMN or equivalent PLMN. IMS voice over PS session supported over 3GPP access. All other features set to "not supported" including the 'Interworking without N26 interface not supported'.	
-----------------------------	------------------------	--	--

Table 11.3.6.3.3-3a: *RRCReconfiguration* (step 6C and step 19C in Table 11.3.6.3.2-3)

Derivation path: TS 38.508-1 [4], Table 4.6.1-13 condition NR and SRB2 and DRB1			
Information Element	Value/remark	Comment	Condition
RRCReconfiguration ::= SEQUENCE {			
dedicatedNAS-MessageList	Not present		
}			

Table 11.3.6.3.3-4: *SIB1* of NR Cell 1 (step 14, Table 11.3.6.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition

SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	7	(= MO_data)	
uac-barringInfoSetIndex	1	Value 1 corresponds to the first entry in uac-BarringInfoSetList	
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF SEQUENCE {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	P00	0% access probability	
uac-BarringTime	s16	16 s	
uac-BarringForAccessIdentity	1111111	Value 1 means that access attempt is not allowed for the corresponding access identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1.	
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not present		
}			
}			

Table 11.3.6.3.3-5: *RRCRResumeRequest* (step 22 and step 24, Table 11.3.6.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-19:			
Information Element	Value/remark	Comment	Condition
RRCRResumeRequest ::= SEQUENCE {			
rrcResumeRequest SEQUENCE {			
resumeCause	mcs-PriorityAccess		
}			
}			

Table 11.3.6.3.3-6: *SIB1* of NR Cell 1 (step 23, Table 11.3.6.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringInfo	Not present		
}			

11.3.7 UAC / Access Identity 11..15 / High Priority Access / HPLMN/0% accessibility AC2/Emergency call

11.3.7.1 Test Purpose (TP)

(1)

with { UE configured for Access Identity 11..15 having received SIB1 containing UAC Info indicating 0% accessibility for Access Category 2 camped in NR RRC\_IDLE state on HPLMN }

ensure that {

when { User initiates MO emergency call }

then { UE does not initiate emergency call on NR Cell }

}

11.3.7.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 clause 4.5.2, 4.5.4.1 and 4.5.6, TS 38.331 clause 5.3.14.2, 5.3.14.4 and 5.3.14.5, TS 22.101 clause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a) for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and
- b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration



0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
NOTE 1: Access identity 1 is valid when: - the USIM file EF <sub>UAC_AIC</sub> indicates the UE is configured for access identity 1 and the selected PLMN, if a new PLMN is selected, or RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or - the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when: - the USIM file EF <sub>UAC_AIC</sub> indicates the UE is configured for access identity 2 and the selected PLMN, if a new PLMN is selected, or RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or - the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).	

...

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
--------	------------------------	------------------------	-----------------

1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message without an ongoing 5GC-MO-LR procedure; Access attempt to handover of ongoing MMTEL voice call, MMTEL video call or SMSoIP from non-3GPP access	Access attempt is for MT access, or handover of ongoing MMTEL voice call, MMTEL video call or SMSoIP from non-3GPP access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b):the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
4.1	MO IMS registration related signalling	Access attempt is for MO IMS registration related signalling (e.g. IMS initial registration, re-registration, subscription refresh) or for NAS signalling connection recovery during ongoing procedure for MO IMS registration related signalling (NOTE 2a)	9 (= MO IMS registration related signalling)

5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call (NOTE 2)	4 (= MO MMTel voice)
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)
7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
8.1	Mobile originated location request	Access attempt is for mobile originated location request (NOTE 9)	3 (= MO_sig)
8.2	Mobile originated signalling transaction towards the PCF	Access attempt is for mobile originated signalling transaction towards the PCF (NOTE 10)	3 (= MO_sig)
9	UE NAS initiated 5GMM connection management procedure or 5GMM NAS transport procedure	Access attempt is for MO data	7 (= MO_data)
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
<p>NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".</p> <p>NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service as defined in subclause 4.5.5, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service as defined in subclause 4.5.5, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.</p> <p>NOTE 2a: Access for the purpose of NAS signalling connection recovery during an ongoing procedure for MO IMS registration related signalling as defined in subclause 4.5.5, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing procedure for MO IMS registration related signalling as defined in subclause 4.5.5, is mapped to the access category of the MO IMS registration related signalling in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.</p> <p>NOTE 3: If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RLPMN or a PLMN equivalent to the RPLMN.</p> <p>NOTE 4: This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.</p> <p>NOTE 5: The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.</p> <p>NOTE 6: If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.</p> <p>NOTE 7: "EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override</p>			

	EAB and the UE does not have a PDU session that was established with EAB override.
NOTE 8:	For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).
NOTE 9:	This includes: a) the UE-initiated NAS transport procedure for transporting a mobile originated location request; b) the 5GMM connection management procedure triggered by a) above; and c) NAS signalling connection recovery during an ongoing 5GC-MO-LR procedure.
NOTE 10:	This includes: a) the UE-initiated NAS transport procedure for transporting a mobile originated signalling transaction towards the PCF; b) the 5GMM connection management procedure triggered by a) above; and c) NAS signalling connection recovery during an ongoing UE triggered V2X policy provisioning procedure.

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following:

- a) subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, if the UE is not operating in SNPN access mode; or
- b) subclause 4.5.2A, table 4.5.2A.1 and table 4.5.2A.2, and subclause 4.5.3, if the UE is operating in SNPN access mode,

and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

NOTE 1: The access barring check is performed by the lower layers.

NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

...

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

...

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

...

- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:

- 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN or SNPN selected by upper layers (see TS 24.501 [23]):
  - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN or to the SNPN selected by upper layers;
  - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
- 3> else if *SIB1* includes *uac-BarringForCommon*:
  - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
- 3> else:
  - 4> consider the access attempt as allowed;
- 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
  - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
    - 5> select the *UAC-BarringPerCat* entry;
    - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
      - 6> select the *UAC-BarringInfoSet* entry;
      - 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
    - 5> else:
      - 6> consider the access attempt as allowed;
  - 4> else:
    - 5> consider the access attempt as allowed;
- 3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:
  - 4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;
  - 4> if the *uac-BarringInfoSetList* contains the *UAC-BarringInfoSet* entry corresponding to the selected *uac-BarringInfoSetIndex*:
    - 5> select the *UAC-BarringInfoSet* entry;
    - 5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
  - 4> else:
    - 5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

...

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends.

[TS 38.331, clause 5.3.14.5]

The UE shall:

1> if one or more Access Identities are indicated according to TS 24.501 [23], and

1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:

2> consider the access attempt as allowed;

1> else:

2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;

2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":

3> consider the access attempt as allowed;

2> else:

3> consider the access attempt as barred;

1> if the access attempt is considered as barred:

2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;

2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":

$$T390 = (0.7 + 0.6 * rand) * uac-BarringTime.$$

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment.

Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.

11.3.7.3

Test description

11.3.7.3.1

Pre-test conditions

System Simulator:

- NR Cell 1
- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3 is configured as per table 11.3.7.3.1-1(PLMN1 is the HPLMN). System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2.

Table 11.3.7.3.1-1: PLMN identifiers

NR Cell	PLMN names	MCC	MNC
NR Cell 1	PLMN1	001	01

UE:

- The UE is equipped with a USIM configuration as defined in TS 38.508-1 [4] Table 6.4.1-17.

Preamble:

- The UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], Table 4.5.2.2-2.

11.3.7.3.2

Test procedure sequence

Table 11.3.7.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE attempt an emergency call dialling a number which is stored on the ME (e.g. 112 or 911). (NOTE 1)	-	-	-	-
2	Check: Does the UE transmit an <i>RRCSetupRequest</i> message with <i>establishmentCause</i> set to 'emergency' within 30 s'?	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
NOTE 1: This could be done by e.g. MMI or AT command.					

11.3.7.3.3

Specific message contents

Table 11.3.7.3.3-1: *SIB1* for NR Cell 1 (preamble, Table 11.3.7.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition

SIB1 ::= SEQUENCE {			
uac-BarringForCommon SEQUENCE {			
UAC-BarringPerCatList ::= SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	2		
uac-barringInfoSetIndex	1		
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList ::= SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00		
uac-BarringTime	s64		
uac-BarringForAccessIdentity	'0011111'B		
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			

11.3.8

UAC / Access Identity 0 / NR RRC\_IDLE / Cell re-selection while T390 is running

11.3.8.1

Test Purpose (TP)

(1)

**with** { UE not configured for special AIs (1,2,11-15) ,having access barred for MO MMTEL Voice and T390 running in NR RRC\_IDLE state}

**ensure that** {

**when** { UE performs Cell Reselection to a new NR Cell }

**then** { UE stops T390 for MO MMTEL Voice and informs upper layers about barring alleviation for this Access Category }

  }

11.3.8.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in TS 24.501: clause 4.5.2, 4.5.4.1 and 4.5.6 and TS 38.331: clause 5.3.14.1, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.2]

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

- a)
- for each of the access identities 1, 2, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and



b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

Access Identity number	UE configuration
0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for multimedia priority service (MPS).
2 (NOTE 2)	UE is configured for mission critical service (MCS).
3-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.
NOTE 1: Access identity 1 is valid when: - the USIM file EFUAC_AIC indicates the UE is configured for access identity 1 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); or - the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when: - the USIM file EFUAC_AIC indicates the UE is configured for access identity 2 and the RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or - the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid in RPLMN or equivalent PLMN" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.	
NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).	

The UE uses the MPS indicator bit of the 5GS network feature support IE to determine if access identity 1 is valid. Processing of the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 1 to be valid when the UE is not in the country of its HPLMN prior to receiving the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 1 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 1 and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 1, the UE uses the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 1 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 1, the MPS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

The UE uses the MCS indicator bit of the 5GS network feature support IE to determine if access identity 2 is valid. Processing of the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 2 to be valid when the UE is not in the country of its HPLMN prior to receiving the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid in RPLMN or equivalent PLMN".

When the UE is in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 2

and access classes 11 - 15. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> does not indicate the UE is configured for access identity 2, the UE uses the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 2 is valid. When the UE is in the country of its HPLMN, and the USIM file EF<sub>UAC\_AIC</sub> indicates the UE is configured for access identity 2, the MCS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN, the contents of the USIM files EF<sub>UAC\_AIC</sub> and EF<sub>ACC</sub> are not applicable.

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

Rule #	Type of access attempt	Requirements to be met	Access Category
1	Response to paging or NOTIFICATION over non-3GPP access; 5GMM connection management procedure initiated for the purpose of transporting an LPP message	Access attempt is for MT access	0 (= MT_acc)
2	Emergency	UE is attempting access for an emergency session (NOTE 1, NOTE 2)	2 (= emergency)
3	Access attempt for operator-defined access category	UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition	32-63 (= based on operator classification)
4	Access attempt for delay tolerant service	(a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and (b).the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN (NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8)	1 (= delay tolerant)
5	MO MMTel voice call	Access attempt is for MO MMTel voice call or for NAS signalling connection recovery during ongoing MO MMTel voice call (NOTE 2)	4 (= MO MMTel voice)
6	MO MMTel video call	Access attempt is for MO MMTel video call or for NAS signalling connection recovery during ongoing MO MMTel video call (NOTE 2)	5 (= MO MMTel video)

7	MO SMS over NAS or MO SMSoIP	Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer (NOTE 2)	6 (= MO SMS and SMSoIP)
8	UE NAS initiated 5GMM specific procedures	Access attempt is for MO signalling	3 (= MO_sig)
9	UE NAS initiated 5GMM connection management procedure or 5GMM NAS transport procedure	Access attempt is for MO data	7 (= MO_data)
10	An uplink user data packet is to be sent for a PDU session with suspended user-plane resources	No further requirement is to be met	7 (= MO_data)
<p>NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".&lt;</p> <p>NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.</p> <p>NOTE 3: If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RLPMN or a PLMN equivalent to the RPLMN.</p> <p>NOTE 4: This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.</p> <p>NOTE 5: The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.</p> <p>NOTE 6: If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.</p> <p>NOTE 7: "EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.</p> <p>NOTE 8: For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).</p>			

[TS 24.501, clause 4.5.4.1]

When the UE is in 5GMM-IDLE mode, upon receiving a request from the upper layers for an access attempt, the NAS shall categorize the access attempt into access identities and an access category following subclause 4.5.2, table 4.5.2.1 and table 4.5.2.2, and subclause 4.5.3, and provide the applicable access identities and the access category to the lower layers for the purpose of access control checking. In this request to the lower layer the NAS can also provide to the lower layer the RRC establishment cause determined as specified in subclause 4.5.6 of this specification.

- NOTE 1: The access barring check is performed by the lower layers.
- NOTE 2: As an implementation option, the NAS can provide the RRC establishment cause to the lower layers after being informed by the lower layers that the access attempt is allowed.

If the UE has uplink user data pending for one or more PDU sessions when it builds a REGISTRATION REQUEST or SERVICE REQUEST message as initial NAS message, the UE shall indicate the respective PDU sessions in the Uplink data status IE as specified in subclause 5.5.1.3.2 and 5.6.1.2, regardless of the access category for which the access barring check is performed.

NOTE 3: The UE indicates pending user data for all the respective PDU sessions, even if barring timers are running for some of the corresponding access categories.

If the lower layers indicate that the access attempt is allowed, the NAS shall initiate the procedure to send the initial NAS message for the access attempt.

If the lower layers indicate that the access attempt is barred, the NAS shall not initiate the procedure to send the initial NAS message for the access attempt. Additionally:

- a) if the event which triggered the access attempt was an MO-MMTEL-voice-call-started indication or an MO-MMTEL-video-call-started indication:
  - 1) if the UE is operating in the single-registration mode and the UE's usage setting is "voice centric", the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed; and
- b) if the event which triggered the access attempt was an MO-SMSoIP-attempt-started indication:
  - 1) if the UE is operating in the single-registration mode, the UE may attempt to select an E-UTRA cell connected to EPC. If the UE finds a suitable E-UTRA cell connected to EPC, it then proceeds with the appropriate EMM specific procedures and, if necessary, ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.2 and 3GPP TS 24.301 [15];
  - 2) if the UE is operating in the dual-registration mode, the UE may proceed in S1 mode with the appropriate EMM specific procedures and ESM procedures to make a PDN connection providing access to IMS available; see subclause 4.8.3 and 3GPP TS 24.301 [15];
  - 3) otherwise, the NAS layer shall notify the upper layers that the access attempt is barred. In this case, upon receiving an indication from the lower layers that the barring is alleviated for the access category with which the access attempt was associated, the NAS shall notify the upper layers that the barring is alleviated for the access category and may initiate the procedure to send the initial NAS message, if still needed.

NOTE 4: Barring timers, on a per access category basis, are run by the lower layers. At expiry of barring timers, the indication of alleviation of access barring is indicated to the NAS on a per access category basis.

[TS 24.501, clause 4.5.6]

When 5GMM requests the establishment of a NAS-signalling connection, the RRC establishment cause used by the UE shall be selected according to one or more access identities (see subclause 4.5.2) and the determined access category as specified in table 4.5.6.1 and table 4.5.6.2. If the determined access category is an operator-defined access category, then the RRC establishment cause used by the UE shall be selected according to table 4.5.6.1 and table 4.5.6.2 based on one or more access identities (see subclause 4.5.2) and the standardized access category determined for the operator-defined access category as described in subclause 4.5.3.

Table 4.5.6.1: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via NR connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VideoCall
	6 (= MO SMS and SMSoIP)	mo-SMS
	7 (= MO_data)	mo-Data
1	Any category	mps-PriorityAccess
2	Any category	mcs-PriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

Table 4.5.6.2: Mapping table for access identities/access categories and RRC establishment cause when establishing N1 NAS signalling connection via E-UTRA connected to 5GCN

Access identities	Access categories	RRC establishment cause is set to
0	0 (= MT_acc)	mt-Access
	1 (= delay tolerant)	Not applicable (NOTE 1)
	2 (= emergency)	emergency
	3 (= MO_sig)	mo-Signalling
	4 (= MO MMTel voice)	mo-VoiceCall
	5 (= MO MMTel video)	mo-VoiceCall
	6 (= MO SMS and SMSoIP)	mo-Data
	7 (= MO_data)	mo-Data
1	Any category	highPriorityAccess
2	Any category	highPriorityAccess
11, 15	Any category	highPriorityAccess
12,13,14,	Any category	highPriorityAccess
NOTE 1: A UE using access category 1 for the access barring check will determine a second access category in the range 3 to 7 that is to be used for determination of the RRC establishment cause. See subclause 4.5.2, table 4.5.2.2, NOTE 6.		
NOTE 2: See subclause 4.5.2, table 4.5.2.1 for use of the access identities of 0, 1, 2, and 11-15.		

[TS 38.331, clause 5.3.14.1]

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a handover resulting in change of PCell in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SIB1*) from the target cell.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
- 2> consider the access attempt as barred;

- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):
      - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;
      - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
    - 3> else if *SIB1* includes *uac-BarringForCommon*:
      - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
    - 3> else:
      - 4> consider the access attempt as allowed;
    - 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
      - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
        - 5> select the *UAC-BarringPerCat* entry;
        - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
          - 6> select the *UAC-BarringInfoSet* entry;
          - 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
      - 5> else:
        - 6> consider the access attempt as allowed;
    - 4> else:
      - 5> consider the access attempt as allowed;
    - 3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:
      - 4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;

4> if the uac-BarringInfoSetList contains the UAC-BarringInfoSet entry corresponding to the selected uac-BarringInfoSetIndex:

5> select the *UAC-BarringInfoSet* entry;

5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";

4> else:

5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

3> if timer T302 is running:

4> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

1> if timer T302 expires or is stopped, and if timer T390 corresponding to an Access Category is not running; or

1> if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running; or

1> if timer T390 corresponding to the Access Category '2' expires or is stopped:

2> consider the barring for this Access Category to be alleviated;

1> when barring for an Access Category is considered being alleviated:

2> if the Access Category was informed to upper layers as barred:

3> inform upper layers about barring alleviation for the Access Category.

2> if barring is alleviated for Access Category '8':

3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:
- 2> consider the access attempt as allowed;
- 1> else:
- 2> draw a random number '*rand*' uniformly distributed in the range:  $0 \leq rand < 1$ ;
- 2> if '*rand*' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":
- 3> consider the access attempt as allowed;
- 2> else:
- 3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:
- 2> draw a random number '*rand*' that is uniformly distributed in the range  $0 \leq rand < 1$ ;
- 2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":
- T390 = (0.7+ 0.6 \* *rand*) \* *uac-BarringTime*.

11.3.8.3                    Test description

11.3.8.3.1                Pre-test conditions

System Simulator:

- NR Cell 1 and NR Cell 3 belong to the same tracking areas according to TS 38.508-1 [4] Table 4.4.2-3.
- System information combination NR-4 in TS 38.508-1 [4] sub-clause 4.4.3.1.2 is used in NR cells

UE:

None.

Preamble:

The UE is in state 1N-A on NR cell 1 according to TS 38.508-1 [4] Table 4.4A.2-1.

11.3.8.3.2                Test procedure sequence

Table 11.3.8.3.2-1/2 illustrate the downlink power levels and other changing parameters to be applied for the cell at various time instants of the test execution. The exact instants on which these values shall be applied are described in the texts in this clause. The configuration “T1” indicates the initial conditions for preamble. Configurations marked "T2" is applied at the points indicated in the Main behaviour description in Table 11.3.8.3.2-3.

Table 11.3.8.3.2-1: Time instances of cell power level and parameter changes for FR1

	Parameter	Unit	NR Cell 1	NR Cell 3	Remark
--	-----------	------	-----------	-----------	--------



T1	SS/PBCH SSS EPRE	dBm/ SCS	-88	Off	The power level is such that $Srxlev_{NRCell1} > 0$
	Qrxlevmin	dBm	-110	-	
T2	SS/PBCH SSS EPRE	dBm/ SCS	-99	-88	The power level values are assigned to satisfy $R_{NRCell\ 1} < R_{NRCell\ 3}$
	Qrxlevmin	dBm	-110	-110	

Table 11.3.8.3.2-2: Time instances of cell power level and parameter changes for FR2

	Parameter	Unit	NR Cell 1	NR Cell 3	Remark
T1	SS/PBCH SSS EPRE	dBm/ SCS	-82	Off	The power level is such that $Srxlev_{NRCell1} > 0$
	Qrxlevmin	dBm	- 110+Delta( NRf1)	-	
T2	SS/PBCH SSS EPRE	dBm/ SCS	-91	-82	The power level values are assigned to satisfy $R_{NRCell\ 1} < R_{NRCell\ 3}$
	Qrxlevmin	dBm	- 110+Delta( NRf1)	- 110+Delta( NRf1)	

Table 11.3.8.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Make the UE attempt an MTSI MO Speech Call (Note 1). Timer T390 is started (Note 2)	-	-	-	-
2	Check: Does the UE send NR <i>RRCSetupRequest</i> with <i>EstablishmentCause</i> set to ' <i>mo-VoiceCall</i> ' in the next 5 sec?	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
3	Set the power levels according to “T2” as per Table 11.3.8.3.2-1/2 for UE to reselect to NR Cell 3.	-	-	-	-
4	FR1: Wait for 34 seconds after step 3 and within 20 seconds make the UE attempt an MTSI MO Speech Call FR2: Wait for 130 seconds after step 3 and within 20 seconds make the UE attempt an MTSI MO Speech Call (Note 3) (Note 1).				
5	Check: Does the UE send NR <i>RRCSetupRequest</i> with <i>EstablishmentCause</i> set to ' <i>mo-VoiceCall</i> ' on NR Cell 3?	-->	NR RRC: <i>RRCSetupRequest</i>	1	P
5A	The SS transmits an <i>RRCSetup</i> message.	<--	NR RRC: <i>RRCSetup</i>		
5B	The UE transmits an <i>RRCSetupComplete</i> .	-->	NR RRC: <i>RRCSetupComplete</i>		
6	SS transmits an <i>RRCRelease</i> message to release RRC connection and move the UE to RRC_IDLE.	<--	NR RRC: <i>RRCRelease</i>	-	-
Note 1: MO MMTEL Voice call is triggered by AT commands. Note 2: T390 timer value is calculated by “T390 = (0.7+ 0.6 * rand) * uac-BarringTime”. With uac-BarringTime as s256 the worst-case timer value is 180 seconds which covers both FR1 and FR2 reselection scenario. Note 3: The wait time for reselection to a newly detected inter frequency cell is selected to cover T <sub>detect,NR_Inter</sub> (25*1280ms=32s for FR1 and 25*4*1280ms=128s for FR2) + T <sub>SI-NR</sub> (1.28s for FR1 and FR2) = 33.28s rounded up to 34s for FR1 and 129.28s rounded up to 130s for FR2. 20 seconds is an arbitrary value chosen to allow the user to make the MTSI MO Speech Call.					

11.3.8.3.3 Specific message contents

Table 11.3.8.3.3-1: SIB1 for NR Cell 1 (All steps, Table 11.3.8.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringForCommon SEQUENCE {			
UAC-BarringPerCatList SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	4		
uac-barringInfoSetIndex	1		
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList ::= SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00		
uac-BarringTime	s256		
uac-BarringForAccessIdentity	'0000000'B		
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			

### 11.3.9 UAC / Access Identity 0 / ODAC / PLMN / RPLMN / not EPLMN

#### 11.3.9.1 Test Purpose (TP)

(1)

**with** { UE not configured for special AIs (1,2,11-15) having received Operator Defined Access Category ""x"" in the range 32..63 with access category criteria type set to ""DNN"" valid in the selected PLMN or RPLMN as part of Registration Procedure }

**ensure that** {

**when** { SIB1 message indicates no barring for Access category 7 but 0% accessibility for Access Category ""x" }

**then** { UE does not initiate PDU Session Establishment for the "DNN" }

}

(2)

**with** { UE not configured for special AIs (1,2,11-15) having received Operator Defined Access Category ""x"" in the range 32..63 with access category criteria type set to ""DNN"" valid in the selected PLMN or RPLMN as part of Registration Procedure , SIB1 message indicates no barring for Access category 7 but 0% accessibility for Access Category ""x" }

**ensure that** {

**when** { UE moves to another cell belonging to a different PLMN not equivalent to the previous PLMN }

**then** { UE is able to initiate PDU Session Establishment for "DNN" in the new PLMN }

}

#### 11.3.9.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in TS 24.501: clause 4.5.3 and TS 38.331: clause 5.3.14.1, 5.3.14.2, 5.3.14.4 and 5.3.14.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, clause 4.5.3]

Operator-defined access category definitions can be signalled to the UE using NAS signalling. Each operator-defined access category definition consists of the following parameters:

- a) a precedence value which indicates in which order the UE shall evaluate the operator-defined category definition for a match;
- b) an operator-defined access category number, i.e. access category number in the 32-63 range that uniquely identifies the access category in the PLMN in which the access categories are being sent to the UE;
- c) criteria consisting of one or more access category criteria type and associated access category criteria type values. The access category criteria type can be set to one of the following:
  - 1) DNN;
  - 2) OS Id + OS App Id of application triggering the access attempt; or
  - 3) S-NSSAI; and

NOTE 1: An access category criteria type can be associated with more than one access category criteria values.

- d) optionally, a standardized access category. This standardized access category is used in combination with the access identities of the UE to determine the RRC establishment cause as specified in subclause 4.5.6.

An access attempt matches the criteria of an operator-defined access category definition, if the access attempt matches all access category criteria types included in the criteria with any of the associated access criteria type values.

Each operator-defined access category definition has a different precedence value.

Several operator-defined access category definitions can have the same operator-defined access category number.

If:

- an access category in bullet d) is not provided;
- an access category in bullet d) is provided and is not a standardized access category; or
- an access category in bullet d) is provided, is a standardized access category and is not recognized by the UE;

the UE shall use instead:

- access category 3 (MO\_sig) if the access attempt is triggered by uplink signalling; or
- access category 7 (MO\_data) if the access attempt is triggered by uplink data

in combination with the access identities of the UE to determine the RRC establishment cause as specified in subclause 4.5.6.

The operator-defined access category definitions are valid in the PLMN which provided them and in a PLMN equivalent to the PLMN which provided them, as specified in annex C.

If the UE stores operator-defined access category definitions valid in the selected PLMN or the RPLMN, then access control in 5GMM-IDLE mode will only be performed for the event a) defined in subclause 4.5.1. If the transition from 5GMM-IDLE mode over 3GPP access to 5GMM-CONNECTED mode is due to a UE NAS initiated 5GMM specific procedure, then this access attempt shall be mapped to one of the standardized access categories in the range < 32, see subclause 4.5.2. I.e. for this case the UE shall skip the checking of operator-defined access category definitions.

If the UE stores operator-defined access category definitions valid in the selected PLMN or the RPLMN, then access control in 5GMM-CONNECTED mode and in 5GMM-CONNECTED mode with RRC inactive indication will only be performed for the events 1) to 6) defined in subclause 4.5.1.

The UE shall handle the operator-defined access category definitions stored for the RPLMN as specified in subclause 5.4.4.3, subclause 5.5.1.2.4, and subclause 5.5.1.3.4.

When the UE is switched off, the UE shall keep the operator-defined access category definitions so that the operator-defined access category definitions can be used after switch on.

When the UE selects a new PLMN which is not equivalent to the previously selected PLMN, the UE shall stop using the operator-defined access category definitions stored for the previously selected PLMN and should keep the operator-defined access category definitions stored for the previously selected PLMN.

NOTE 2: When the UE selects a new PLMN which is not equivalent to the previously selected PLMN, the UE can delete the operator-defined access category definitions stored for the previously selected PLMN e.g. if there is no storage space in the UE.

[TS 38.331, clause 5.3.14.1]

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a PCell change in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained *SIB1* (as specified in 5.2.2.2) from the target cell.

[TS 38.331, clause 5.3.14.2]

Upon initiation of the procedure, the UE shall:

- 1> if timer T390 is running for the Access Category:
  - 2> consider the access attempt as barred;
- 1> else if timer T302 is running and the Access Category is neither '2' nor '0':
  - 2> consider the access attempt as barred;
- 1> else:
  - 2> if the Access Category is '0':
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [23]):
      - 4> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;
      - 4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;
    - 3> else if *SIB1* includes *uac-BarringForCommon*:
      - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;
    - 3> else:
      - 4> consider the access attempt as allowed;
    - 3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:
      - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
        - 5> select the *UAC-BarringPerCat* entry;
        - 5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:
          - 6> select the *UAC-BarringInfoSet* entry;

- 6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
- 5> else:
  - 6> consider the access attempt as allowed;
- 4> else:
  - 5> consider the access attempt as allowed;
- 3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:
  - 4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;
  - 4> if the *uac-BarringInfoSetList* contains the *UAC-BarringInfoSet* entry corresponding to the selected *uac-BarringInfoSetIndex*:
    - 5> select the *UAC-BarringInfoSet* entry;
    - 5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";
  - 4> else:
    - 5> consider the access attempt as allowed;
- 3> else:
  - 4> consider the access attempt as allowed;
- 1> if the access barring check was requested by upper layers:
  - 2> if the access attempt is considered as barred:
    - 3> if timer T302 is running:
      - 4> if timer T390 is running for Access Category '2':
        - 5> inform the upper layer that access barring is applicable for all access categories except categories '0', upon which the procedure ends;
      - 4> else:
        - 5> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;
    - 3> else:
      - 4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;
  - 2> else:
    - 3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;
- 1> else:
  - 2> the procedure ends.

[TS 38.331, clause 5.3.14.4]

The UE shall:

- 1> if timer T302 expires or is stopped:
  - 2> for each Access Category for which T390 is not running:
    - 3> consider the barring for this Access Category to be alleviated;
- 1> else if timer T390 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running:
  - 2> consider the barring for this Access Category to be alleviated;
- 1> else if timer T390 corresponding to the Access Category '2' expires or is stopped:
  - 2> consider the barring for this Access Category to be alleviated;
- 1> when barring for an Access Category is considered being alleviated:
  - 2> if the Access Category was informed to upper layers as barred:
    - 3> inform upper layers about barring alleviation for the Access Category.
  - 2> if barring is alleviated for Access Category '8':
    - 3> perform actions specified in 5.3.13.8;

[TS 38.331, clause 5.3.14.5]

The UE shall:

- 1> if one or more Access Identities are indicated according to TS 24.501 [23], and
- 1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:
  - 2> consider the access attempt as allowed;
- 1> else:
  - 2> draw a random number 'rand' uniformly distributed in the range:  $0 \leq \text{rand} < 1$ ;
  - 2> if 'rand' is lower than the value indicated by *uac-BarringFactor* included in "UAC barring parameter":
    - 3> consider the access attempt as allowed;
  - 2> else:
    - 3> consider the access attempt as barred;
- 1> if the access attempt is considered as barred:
  - 2> draw a random number 'rand' that is uniformly distributed in the range  $0 \leq \text{rand} < 1$ ;
  - 2> start timer T390 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":
$$T390 = (0.7 + 0.6 * \text{rand}) * \text{uac-BarringTime}.$$

11.3.9.3                    Test description

11.3.9.3.1                Pre-test conditions

System Simulator:

- 2 NR cells: NR Cell 1 and 12 as specified in TS 38.508-1 [4] table 4.4.2-3.
- System information combination NR-1 as defined in TS 38.508-1 [4] Table 4.4.3.1.2-1 is used in NR cells.

UE:

- None.

Preamble:

- The UE is registered on PLMN1 (NR Cell 1) and in state 3N-A on NR Cell 1(serving cell) by using the procedure described in TS 38.508-1 [4] clause 4.5.2.2 with “connected without release” except that the REGISTRATION ACCEPT message indicates Operator Defined Access Category ""33"" as described in Table 11.3.9.3.3-1.

11.3.9.3.2                Test procedure sequence

Table 11.3.9.3.2-1 for FR1 and Table 11.3.9.3.2-2 for FR2 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Row marked "T0" denotes the initial conditions in preamble, while the column marked "T1" is to be applied subsequently in the Main behaviour. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 11.3.9.3.2-1: Time instances of cell power level and parameter changes for FR1

	Parameter	Unit	NR Cell 1	NR Cell 12	Remarks
T0	SS/PBCH SSS EPRE	dBm/SCS	-88	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
T1	SS/PBCH SSS EPRE	dBm/SCS	Off	-88	The power level values are assigned to ensure UE registered on NR Cell 12.
Note 1:    Power level “Off” is defined in TS 38.508-1 [4] Table 6.2.2.1-3.					

Table 11.3.9.3.2-2: Time instances of cell power level and parameter changes for FR2

	Parameter	Unit	NR Cell 1	NR Cell 12	Remarks
T0	SS/PBCH SSS EPRE	dBm/SCS	-82	Off	The power level values are assigned to ensure UE registered on NR Cell 1.
T1	SS/PBCH SSS EPRE	dBm/SCS	Off	-82	The power level values are assigned to ensure UE registered on NR Cell 12.
Note 1:    Power level “Off” is defined in TS 38.508-1 [4] Table 6.2.2.2-2.					

Table 11.3.9.3.2-3: Main behaviour



St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-2	Void	-	-	-	-
3	Make the UE attempt to establish a PDU session for the DNN defined in Table 11.3.9.3.3-1. This can be done by an AT/MMI command.	-	-	-	-
4	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST and the DNN in UL NAS TRANSPORT message is the same value in UL NAS TRANSPORT message in preamble within 20s?	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	F
5	The SS adjusts the NR Cells power levels according to row "T1" in table 11.3.9.3.2-1/2.	-	-	-	-
6	The mobility registration updating procedure described in TS 38.508-1 [4] Table 4.9.5.2.2-1 is performed on NR Cell 12 and release RRC connection.	-	-	-	-
7	Make the UE attempt to establish a PDU session for the DNN defined in Table 11.3.9.3.3-1. This can be done by an AT/MMI command.	-	-	-	-
8	Check: Does the UE transmit a <i>RRCSetupRequest</i> message and <i>establishmentCause</i> is set to <i>mo-Data</i> ?	-->	NR RRC: <i>RRCSetupRequest</i>	2	P
9-14	Steps 3-8 of the generic procedure for NR RRC_Connected specified in TS 38.508-1 Table 4.5.4.2-3 are performed.	-	-	-	-
15	Check: Does the UE transmit a PDU SESSION ESTABLISHMENT REQUEST and the DNN value in UL NAS TRANSPORT message is the same as the DNN value of Operator-defined access category definitions defined in Table 11.3.9.3.3-1	-->	5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	2	P
16	The SS transmits <i>RRCReconfiguration</i> message containing PDU SESSION ESTABLISHMENT ACCEPT message.	<--	NR RRC : <i>RRCReconfiguration</i> 5GMM: DL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT ACCEPT	-	-
17	The UE transmits <i>RRCReconfigurationComplete</i> message to confirm the establishment of DRB.	-->	NR RRC : <i>RRCReconfigurationComplete</i>	-	-
18	Void	-	-	-	-

11.3.9.3.3 Specific message contents

Table 11.3.9.3.3-1: REGISTRATION ACCEPT (preamble)

Derivation path: TS 38.508 [4] Table 4.7.1-7			
Information Element	Value/remark	Comment	Condition

Operator-defined access category definitions			
Precedence value	'0000 0000'B		
PSAC	'1'B	Value 1 means that standardized access category is present.	
Operator-defined access category number	'00001'B	33	
Criteria			
Criteria type	'0000 0000'B	DNN type	
Criteria value			
DNN length-value pair count	'0000 0001'B		
DNN length-value pair			
DNN value length	Set to the length in octets of the DNN value field.		
DNN value	'ABCD'		
Standardized access category	'00111'B	Access category number 7	

Table 11.3.9.3.3-2: SIB1 of NR Cell 1 (preamble and all steps, Table 11.3.9.3.2-3)

Derivation Path: TS 38.508-1 [4], Table 4.6.1-28			
Information Element	Value/remark	Comment	Condition
SIB1 ::= SEQUENCE {			
uac-BarringInfo SEQUENCE {			NR cell 1
uac-BarringForCommon SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat {	1 entry		
UAC-BarringPerCat[1] SEQUENCE {		entry 1	
accessCategory	33		
uac-barringInfoSetIndex	1	Value 1 corresponds to the first entry in uac-BarringInfoSetList	
}			
}			
uac-BarringPerPLMN-List	Not present		
uac-BarringInfoSetList SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet {	1 entry		
UAC-BarringInfoSet[1] SEQUENCE {		entry 1	
uac-BarringFactor	p00	0% access probability	
uac-BarringTime	s16	16 s	
uac-BarringForAccessIdentity	'1111111'B	Value 1 means that access attempt is not allowed for the corresponding access identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1.	
}			
}			
uac-AccessCategory1-SelectionAssistanceInfo	Not Present		
}			
}			

## 11.4 Emergency Services

### 11.4.1 5GMM-REGISTERED.NORMAL-SERVICE / 5GMM-IDLE / Emergency call / Utilising emergency number stored on the USIM / New emergency PDU session / Network failing the authentication check (5G AKA)

#### 11.4.1.1 Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode }

ensure that {

    when { UE is requested to make an outgoing call using an emergency number stored on the USIM }

    then { UE establishes an RRC connection with the RRC *establishmentCause* set to "emergency", **and**, sends a SERVICE REQUEST message with Service type IE set to "emergency services", **and**, establishes a New emergency PDU session by sending an UL NAS TRANSPORT message with Request type set to "initial emergency request" and a PDU SESSION ESTABLISHMENT REQUEST }

    }

(2)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-CONNECTED mode having established an Emergency call }

ensure that {

    when { UE establishes that the network has failed the authentication check during a 5G AKA based primary authentication and key agreement procedure }

    then { UE continues using the current security context, **and**, releases all non-emergency PDU sessions by initiating UE-requested PDU session release procedure and treats the active cell as barred for non-emergency services }

    }

#### 11.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331 [12], subclause 5.3.3.3, TS 24.501 [22], subclauses 5.6.1.2, 6.4.1.2, 5.4.1.3.7, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 38.331, subclause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

- ...
- 1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

[TS 24.501, subclause 5.6.1.2]

The UE initiates the service request procedure by sending a SERVICE REQUEST message to the AMF and starts timer T3517.

If the UE is sending the SERVICE REQUEST message from 5GMM-IDLE mode and the UE needs to send non-clear text IEs, the UE shall send the SERVICE REQUEST message including the NAS message container IE as described in subclause 4.4.6.

...

For case c) in subclause 5.6.1.1, the Uplink data status IE shall not be included in the SERVICE REQUEST message except if the UE has one or more active always-on PDU sessions associated with the access type over which the SERVICE REQUEST message is sent. If the UE is not a UE configured for high priority access in selected PLMN and:

- a) if the SERVICE REQUEST message is triggered by a request for emergency services from the upper layer, the UE shall set the service type IE in the SERVICE REQUEST message to "emergency services"; or

[TS 24.501, subclause 6.4.1.2]

In order to initiate the UE-requested PDU session establishment procedure, the UE shall create a PDU SESSION ESTABLISHMENT REQUEST message.

NOTE 0: When IMS voice is available over either 3GPP access or non-3GPP access, the "voice centric" UE in 5GMM-REGISTERED state will receive a request from upper layers to establish the PDU session for IMS signalling, if the conditions for performing an initial registration with IMS indicated in 3GPP TS 24.229 [14] subclause U.3.1.2 are satisfied.

If the UE requests to establish a new PDU session, the UE shall allocate a PDU session ID which is not currently being used by another PDU session over either 3GPP access or non-3GPP access.

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION ESTABLISHMENT REQUEST message to the allocated PTI value.

...

If the UE requests to establish a new emergency PDU session, the UE shall set the SSC mode IE of the PDU SESSION ESTABLISHMENT REQUEST message to "SSC mode 1".

...

The UE shall transport:

- a) the PDU SESSION ESTABLISHMENT REQUEST message;
- b) the PDU session ID of the PDU session being established, or being handed over or being transferred;

..

- e) the request type which is set to:

...

- 3) "initial emergency request", if the UE requests to establish a new emergency PDU session; and

...

If the request type is set to "initial emergency request" or "existing emergency PDU session", neither DNN nor S-NSSAI is transported by the UE using the NAS transport procedure as specified in subclause 5.4.5.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- ...
- b) Any emergency call number stored on a SIM/USIM when the SIM/USIM is present.

[TS 24.501, subclause 5.4.1.3.7]

- g) Network failing the authentication check.
- If the UE deems that the network has failed the authentication check, then it shall request RRC to locally release the RRC connection and treat the active cell as barred (see 3GPP TS 38.304 [28]). The UE shall start any retransmission timers (e.g. T3510, T3517 or T3521), if they were running and stopped when the UE received the first AUTHENTICATION REQUEST message containing an incorrect authentication challenge data causing authentication failure.

...

For items c, d, e, and f whether or not the UE is registered for emergency services:

- ...
- The UE shall deem that the network has failed the authentication check or assume that the authentication is not genuine and proceed as described in item g above if any of the following occurs:
- the timer T3520 expires;

...

For items c, d, e, and f:

- ...
- If a UE has an emergency PDU session established or is establishing an emergency PDU session when timer T3520 expires, the UE shall not deem that the network has failed the authentication check and not behave as described in item g. Instead the UE shall continue using the current security context, if any, release all non-emergency PDU sessions, if any, by initiating UE-requested PDU session release procedure. If there is an ongoing PDU session establishment procedure, the UE shall release all non-emergency PDU sessions upon completion of the PDU session establishment procedure. The UE shall start any retransmission timers (e.g. T3510, T3517 or T3521) if:
- they were running and stopped when the UE received the AUTHENTICATION REQUEST message and detected an authentication failure;
- the procedures associated with these timers have not yet been completed.

The UE shall behave as if the UE is registered for emergency services.

11.4.1.3

Test description

11.4.1.3.1

Pre-test conditions

System Simulator:

- 2 NR Cells

- NR Cell 1 an NR Cell 2 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates *ims-EmergencySupport*.

**UE:**

- The UE is equipped with a test USIM with USIM Configuration 20 as defined in TS 38.508-1 [4] Table 6.4.1-20 (USIM contains two Emergency Numbers: 144, 117).

**Preamble:**

- Cells power level configuration in accordance with TS 38.508-1 [4], Table 6.2.2.1-3:
  - NR Cell 1 "Serving cell"
  - NR Cell 2 "Non-Suitable "Off" cell"
- The UE is in test state 1N-A as defined in TS 38.508-1 [4], subclause 4.4A.2 on NR Cell 1.

11.4.1.3.2

Test procedure sequence

Table 11.4.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

-	The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
1	Make the UE attempt an IMS emergency call dialling the number 144 which is stored on the USIM. (NOTE 1)	-	-	-	-
2	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	1	-
2A	The SS initiates the 5G AKA based primary authentication and key agreement procedure by sending an AUTHENTICATION REQUEST message; the included ngKSI value is the same as the one used in the initial message SERVICE REQUEST sent in step 2.	<--	AUTHENTICATION REQUEST	-	-
2B	The UE sends an AUTHENTICATION FAILURE message with 5GMM cause #71 "ngKSI already in use"	-->	AUTHENTICATION FAILURE	-	-
-	EXCEPTION: Depending on the number of non-IMS Emergency relevant PDUs active at this moment of time step 2C is repeated 1 or more times.	-	-	-	-
2C	FOR i=1 TO i=pc_noOf_PDUs  Repeat the PDU session release procedure specified in Table 11.4.1.3.2-2: Parallel behaviour.  Depending on UE implementation the PDU session release procedures can run in parallel or in sequence.	-	-	-	-
3	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
4	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
5	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
6	Make the UE attempt an IMS [non-emergency] call. (NOTE 1)				
7	Check: Does the UE transmit in the next 10 sec an <i>RRCSetupRequest</i> message?	-->	NR RRC: <i>RRCSetupRequest</i>	2	F
-	The SS configures: - NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 2 as "Serving cell".	-	-	-	-
-	The following messages are to be observed on NR Cell 2 unless explicitly stated otherwise.	-	-	-	-
8	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5, ' <i>connected without release</i> '.	-	-	-	-
9	The UE performs the generic procedure for UE-requested PDU session(s) establishment, specified in TS 38.508-1 [4] subclause 4.5A.2, performing establishment of UE-requested PDU session(s) with ExpectedNumberOfNewPDUSessions = pc_noOf_PDUs.	-	-	2	-
NOTE 1: This could be done by e.g. MMI or AT command.					

Table 11.4.1.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
1	Check: Does the UE transmit a PDU SESSION RELEASE REQUEST message with PDU session ID equal to one of the IDs of an existing PDU session BUT different to the PDU session ID assigned to the Emergency PDU session in step 2, Table 11.4.1.3.2-1?	-	PDU SESSION RELEASE REQUEST	2	P
2	Check: Does the UE perform PDU session release procedure defined in clause 4.9.21 of TS 38.508-1 [4]?	-		2	P

11.4.1.3.3 Specific message contents

Table 11.4.1.3.3-1: Message AUTHENTICATION REQUEST (step 2A, Table 11.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-1			
Information Element	Value/Remark	Comment	Condition
ngKSI	The same ng-KSI assigned in the Preamble and indicated in the initial message SERVICE REQUEST sent in step 2		

Table 11.4.1.3.3-2: Message AUTHENTICATION FAILURE (step 2B, Table 11.4.1.3.2-1)

Derivation path: TS 38.508-1 [4], Table 4.7.1-4			
Information Element	Value/Remark	Comment	Condition
5GMM cause	'0100 0111'B	ngKSI already in use	

11.4.2 5GMM-DEREGISTERED.LIMITED-SERVICE / Emergency call / Utilisation of emergency numbers stored on the ME / Initial registration for emergency services / Handling of forbidden PLMNs

11.4.2.1 Test Purpose (TP)

(1)

with { UE in 5GMM-DEREGISTERED.LIMITED-SERVICE state }

ensure that {

    when { UE is requested to make an outgoing call using an emergency number stored on the ME }

        then { UE establishes an RRC connection with the RRC *establishmentCause* set to "emergency", and, attempts an Initial registration for emergency services by sending a REGISTRATION REQUEST message



with IE Service type set to "emergency services", **and**, accepts and applies security with NULL security and integrity algorithms, **and**, after successful completion of the registration for emergency services establishes an emergency PDU session by sending an UL NAS TRANSPORT message with Request type set to "initial emergency request" and a PDU SESSION ESTABLISHMENT REQUEST }

}

(2)

**with** { UE in 5GMM-DEREGISTERED.LIMITED-SERVICE state }

**ensure that** {

**when** { UE has performed an IMS Emergency call on a forbidden PLMN }

**then** { UE does not remove the PLMN code of the accessed PLMN from the list of forbidden PLMNs }

}

11.4.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331 [12], subclause 5.3.3.3, TS 23.501 [37], subclause 5.16.4.1, TS 23.122 [38], subclauses 2, 3.1, 3.5, TS 24.501 [22], subclauses 4.4.4.1, 5.1.3.2.1.3.3, 5.3.2, 5.4.2.3, 5.5.1.2.2, 5.5.1.2.4, 6.4.1.2, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 36.331, subclause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

...

1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

[TS 23.501, subclause 5.16.4.1]

UEs that are in limited service state, as specified in TS 23.122 [17], or that camp normally on a cell but failed to register successfully to the network under conditions specified in TS 24.501 [47], initiate the Registration procedure by indicating that the registration is to receive Emergency Services, referred to as Emergency Registration, and a Follow-on request is included in the Registration Request to initiate PDU Session Establishment procedure with a Request Type indicating "Emergency Request". UEs that had registered for normal services and do not have emergency PDU Sessions established and that are subject to Mobility Restriction in the present area or RAT (e.g. because of restricted tracking area) shall initiate the UE Requested PDU Session Establishment procedure to receive Emergency Services, i.e. with a Request Type indicating "Emergency Request". Based on local regulation, the network supporting Emergency Services for UEs in limited service state provides Emergency Services to these UE, regardless whether the UE can be authenticated, has roaming or Mobility Restrictions or a valid subscription.

[TS 23.122, clause 2]

If the MS is unable to find a suitable cell to camp on, or the SIM is not inserted, or if it receives certain responses to an LR request (e.g., "illegal MS"), it attempts to camp on a cell irrespective of the PLMN identity, and enters a "limited service" state in which it can only attempt to make emergency calls. An MS operating in NB-S1 mode, never attempts to make emergency calls.

[TS 23.122, subclause 3.1]

An MS that is attaching for emergency bearer services or is attached for emergency bearer services may access PLMNs in the list of "forbidden PLMNs" or the list of "forbidden PLMNs for GPRS service". The MS shall not remove any entry from the list of "forbidden PLMNs" or the list of "forbidden PLMNs for GPRS service" as a result of such accesses.

[TS 23.122, subclause 3.5]

There are a number of situations in which the MS is unable to obtain normal service from a PLMN. These include:

a) Failure to find a suitable cell of the selected PLMN;

...

(In automatic PLMN selection mode, items a, c and f would normally cause a new PLMN selection, but even in this case, the situation may arise when no PLMNs are available and allowable for use).

For the items a to f, the MS attempts to camp on an acceptable cell, irrespective of its PLMN identity, so that emergency calls can be made if necessary, with the exception that an MS operating in NB-S1 mode, shall never attempt to make emergency calls. When in the limited service state with a valid SIM, the MS shall search for available and allowable PLMNs in the manner described in subclause 4.4.3.1 and when indicated in the SIM also as described in subclause 4.4.3.4. For an MS that is not in eCall only mode, with the exception of performing GPRS attach or EPS attach for emergency bearer services, or performing registration for emergency services, no LR requests are made until a valid SIM is present and either a suitable cell is found or a manual network reselection is performed. For an MS in eCall only mode, no LR requests are made except for performing EPS attach for emergency bearer services or registration for emergency services. When performing GPRS attach or EPS attach for emergency bearer services, or registration for emergency services, the PLMN of the current serving cell is considered as the selected PLMN for the duration the MS is attached for emergency bearer services or registered for emergency services. In the limited service state the presence of the MS need not be known to the PLMN on whose cell it has camped.

There are also other conditions under which only emergency calls may be made. These are shown in table 2 in clause 5. ProSe direct communication and ProSe direct discovery for public safety use can be initiated if necessary (see 3GPP TS 24.334 [51]) when in the limited service state due to items a) or c) or f). V2X communication over PC5 can be initiated if necessary (see 3GPP TS 24.386 [59]) when in the limited service state due to items a) or c) or f).

[TS 24.501, subclause 4.4.4.1]

The use of "null integrity protection algorithm" 5G-IA0 (see subclause 9.11.3.32) in the current 5G NAS security context is only allowed for an unauthenticated UE for which establishment of emergency services is allowed. For setting the security header type in outbound NAS messages, the UE and the AMF shall apply the same rules irrespective of whether the "null integrity protection algorithm" or any other integrity protection algorithm is indicated in the 5G NAS security context.

If the "null integrity protection algorithm" 5G-IA0 has been selected as an integrity protection algorithm, the receiver shall regard the NAS messages with the security header indicating integrity protection as integrity protected.

[TS 24.501, subclause 5.1.3.2.1.3.3]

The substate 5GMM-DEREGISTERED.LIMITED-SERVICE is chosen in the UE, when it is known that a selected cell for 3GPP access or TA for non-3GPP access is unable to provide normal service (e.g. the selected cell over 3GPP access is in a forbidden PLMN or is in a forbidden tracking area or TA for non-3GPP access is forbidden).

[TS 24.501, subclause 5.3.2]

The UE provides the SUPI to the network in concealed form. The SUCI is a privacy preserving identifier containing the concealed SUPI. When the SUPI contains a network specific identifier, the SUCI shall take the form of an NAI as specified in 3GPP TS 23.003 [4].

A UE supporting N1 mode includes a SUCI:

- a) in the REGISTRATION REQUEST message when the UE is attempting initial registration procedure and a valid 5G-GUTI is not available; or

...

The UE shall use the "null-scheme" as specified in 3GPP TS 33.501 [24] to generate the SUCI, if the following applies:

- a) the UE performs a registration procedure for emergency services or initiates a de-registration procedure before the registration procedure for emergency services was completed successfully; and

[TS 24.501, subclause 5.4.2.3]

If the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session and the SECURITY MODE COMMAND message is received with ngKSI value "000" and 5G-IA0 and 5G-EA0 as selected 5G NAS security algorithms, the UE shall locally derive and take in use 5G NAS security context. The UE shall delete existing current 5G NAS security context.

The UE shall accept a SECURITY MODE COMMAND message indicating the "null integrity protection algorithm" 5G-EA0 as the selected 5G NAS integrity algorithm only if the message is received when the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session.

[TS 24.501, subclause 5.5.1.2.2]

The UE in state 5GMM-DEREGISTERED shall initiate the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF,

...

- b) when the UE performs initial registration for emergency services;

...

If the UE initiates an initial registration for emergency services or needs to prolong the established NAS signalling connection after the completion of the initial registration procedure (e.g. due to uplink signalling pending), the UE shall set the Follow-on request indicator to 1.

[TS 24.501, subclause 5.5.1.2.4]

If the initial registration procedure is not for emergency services, and if the PLMN identity of the registered PLMN is a member of the list of "forbidden PLMNs", any such PLMN identity shall be deleted from the corresponding list(s).

[TS 24.501, subclause 6.4.1.2]

In order to initiate the UE-requested PDU session establishment procedure, the UE shall create a PDU SESSION ESTABLISHMENT REQUEST message.

NOTE 0: When IMS voice is available over either 3GPP access or non-3GPP access, the "voice centric" UE in 5GMM-REGISTERED state will receive a request from upper layers to establish the PDU session for IMS signalling, if the conditions for performing an initial registration with IMS indicated in 3GPP TS 24.229 [14] subclause U.3.1.2 are satisfied.

If the UE requests to establish a new PDU session, the UE shall allocate a PDU session ID which is not currently being used by another PDU session over either 3GPP access or non-3GPP access.

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION ESTABLISHMENT REQUEST message to the allocated PTI value.

...

If the UE requests to establish a new emergency PDU session, the UE shall set the SSC mode IE of the PDU SESSION ESTABLISHMENT REQUEST message to "SSC mode 1".

...

The UE shall transport:

- a) the PDU SESSION ESTABLISHMENT REQUEST message;
- b) the PDU session ID of the PDU session being established, or being handed over or being transferred;
- ..
- e) the request type which is set to:
  - ...
  - 3) "initial emergency request", if the UE requests to establish a new emergency PDU session; and

...

If the request type is set to "initial emergency request" or "existing emergency PDU session", neither DNN nor S-NSSAI is transported by the UE using the NAS transport procedure as specified in subclause 5.4.5.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.

11.4.2.3

Test description

11.4.2.3.1

Pre-test conditions

System Simulator:

- 1 NR Cell
- NR Cell 1, as defined in TS 38.508-1 [4], Table 4.4.2-3, with the exception that cells' PLMN is defined in Table 11.4.2.3.1-1 below.

Table 11.4.2.3.1-1: PLMN identifiers

NR Cell	PLMN name
1	PLMN2

- System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates *ims-EmergencySupport*.

UE:

- The UE is equipped with a test USIM with USIM Configuration 15 as defined in TS 38.508-1 [4], Table 6.4.1-15 (PLMN2 is set in it as 'forbidden PLMN', PLMN1 is the HPLMN).

Preamble:

- The UE is in test state 0N-B (Switched Off) as defined in TS 38.508-1 [4], subclause 4.4A.2. Prior to being switched off the UE is registered on PLMN1.

11.4.2.3.2 Test procedure sequence

Table 11.4.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Void	-	-	-	-
-	The SS configures: - NR Cell 1 as "Serving cell"	-	-	-	-
2	Switch the UE on.	-	-	-	-
3	Make the UE attempt an IMS emergency call dialling a number which is stored on the ME (e.g. 112 or 911). (NOTE 1)	-	-	-	-
4	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment without IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.12?	-	-	1	-
5	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
6	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
7	Start Timer=10 Check: Does the UE transmit an <i>RRCSetupRequest</i> message in the next 30sec?sec. NOTE: This is an arbitrary value to wait for UE initiated detach.	-	-	-	-
-	EXCEPTION: Steps 8a1-8b3 describes optional behaviour that depends on the UE implementation.	-	-	-	-
8a1	The UE transmits a DEREGISTRATION REQUEST message with De-registration type IE set to "Normal de-registration".	-->	NR RRC: <i>ULInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
8a2	The UE transmits a DEREGISTRATION ACCEPT message.	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
8a3	Stop Timer=10.	-	-	-	-
8b1	Timer=10 sec expires	-	-	-	-
8b2	The SS transmits a DEREGISTRATION REQUEST message with Deregistration type IE set to "re-registration required".	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
8b3	The UE transmits a DEREGISTRATION ACCEPT message.	-->	NR RRC: <i>ULInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
9	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
10	NOTE: This is an arbitrary value to wait for catching not allowed UE behaviour.	-	-	-	-
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.2.3.3                      Specific message contents

Table 11.4.2.3.3-1: REGISTRATION REQUEST (step 4, Table 11.4.2.3.2-1; step 3, TS 38.508-1 [4], Table 4.9.12.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6, condition EMERGENCY.			
Information Element	Value/remark	Comment	Condition
5GS mobile identity	SUCI	The UE shall use the "null-scheme" as specified in 3GPP TS 33.501 [20] to generate the SUCI	

Table 11.4.2.3.3-2: DEREGISTRATION REQUEST (Step 8a1, Table 11.4.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-12, Condition NORMAL.
---

Table 11.4.2.3.3-3: DEREGISTRATION REQUEST (Step 8b2, Table 11.4.2.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-14.			
Information Element	Value/remark	Comment	Condition
De-registration type			
bit 3	'0'B	re-registration not required	
Access type	'01'B	3GPP access	
5GMM cause	'00001011'B	#11 PLMN not allowed	

11.4.3      5GMM-DEREGISTERED.NO-SUPI / Emergency call / Utilisation of emergency numbers stored on the ME / Initial registration for emergency services

11.4.3.1                      Test Purpose (TP)

(1)

with { UE in 5GMM-DEREGISTERED.NO-SUPI state (no USIM) }

ensure that {

    when { UE is requested to make an outgoing call using an emergency number stored on the ME }

        then { UE establishes an RRC connection with the RRC *establishmentCause* set to "emergency", and, attempts an Initial registration for emergency services by sending a REGISTRATION REQUEST message with IE Service type set to "emergency services", and, accepts and applies security with NULL security and integrity algorithms, and, after successful completion of the registration for emergency services establishes an emergency PDU session by sending an UL NAS TRANSPORT message with Request type set to "initial emergency request" and a PDU SESSION ESTABLISHMENT REQUEST }

    }

**11.4.3.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 38.331 [12], subclause 5.3.3.3, TS 23.501 [37], subclause 5.16.4.1, TS 23.122 [38], subclauses 2, 3.5, TS 24.501 [22], subclauses 4.4.4.1, 5.1.3.2.1.3.6, 5.3.2, 5.4.2.3, 5.5.1.2.2, 6.4.1.2, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 36.331, subclause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

...

1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

[TS 23.501, subclause 5.16.4.1]

UEs that are in limited service state, as specified in TS 23.122 [17], or that camp normally on a cell but failed to register successfully to the network under conditions specified in TS 24.501 [47], initiate the Registration procedure by indicating that the registration is to receive Emergency Services, referred to as Emergency Registration, and a Follow-on request is included in the Registration Request to initiate PDU Session Establishment procedure with a Request Type indicating "Emergency Request". UEs that had registered for normal services and do not have emergency PDU Sessions established and that are subject to Mobility Restriction in the present area or RAT (e.g. because of restricted tracking area) shall initiate the UE Requested PDU Session Establishment procedure to receive Emergency Services, i.e. with a Request Type indicating "Emergency Request". Based on local regulation, the network supporting Emergency Services for UEs in limited service state provides Emergency Services to these UE, regardless whether the UE can be authenticated, has roaming or Mobility Restrictions or a valid subscription.

[TS 23.122, clause 2]

If the MS is unable to find a suitable cell to camp on, or the SIM is not inserted, or if it receives certain responses to an LR request (e.g., "illegal MS"), it attempts to camp on a cell irrespective of the PLMN identity, and enters a "limited service" state in which it can only attempt to make emergency calls. An MS operating in NB-S1 mode, never attempts to make emergency calls.

[TS 23.122, subclause 3.5]

There are a number of situations in which the MS is unable to obtain normal service from a PLMN. These include:

...

b) No SIM in the MS;

...

For the items a to f, the MS attempts to camp on an acceptable cell, irrespective of its PLMN identity, so that emergency calls can be made if necessary, with the exception that an MS operating in NB-S1 mode, shall never attempt to make emergency calls. When in the limited service state with a valid SIM, the MS shall search for available and allowable PLMNs in the manner described in subclause 4.4.3.1 and when indicated in the SIM also as described in subclause 4.4.3.4. For an MS that is not in eCall only mode, with the exception of performing GPRS attach or EPS attach for emergency bearer services, or performing registration for emergency services, no LR requests are made until a valid SIM is present and either a suitable cell is found or a manual network reselection is performed. For an MS in eCall only mode, no LR requests are made except for performing EPS attach for emergency bearer services or registration for emergency services. When performing GPRS attach or EPS attach for emergency bearer services, or registration for emergency services, the PLMN of the current serving cell is considered as the selected PLMN for the duration the MS is attached for emergency bearer services or registered for emergency services. In the limited service state the presence of the MS need not be known to the PLMN on whose cell it has camped.

There are also other conditions under which only emergency calls may be made. These are shown in table 2 in clause 5. ProSe direct communication and ProSe direct discovery for public safety use can be initiated if necessary (see 3GPP TS 24.334 [51]) when in the limited service state due to items a) or c) or f). V2X communication over PC5 can be initiated if necessary (see 3GPP TS 24.386 [59]) when in the limited service state due to items a) or c) or f).

[TS 24.501, subclause 4.4.4.1]

The use of "null integrity protection algorithm" 5G-IA0 (see subclause 9.11.3.32) in the current 5G NAS security context is only allowed for an unauthenticated UE for which establishment of emergency services is allowed. For setting the security header type in outbound NAS messages, the UE and the AMF shall apply the same rules irrespective of whether the "null integrity protection algorithm" or any other integrity protection algorithm is indicated in the 5G NAS security context.

If the "null integrity protection algorithm" 5G-IA0 has been selected as an integrity protection algorithm, the receiver shall regard the NAS messages with the security header indicating integrity protection as integrity protected.

[TS 24.501, subclause 5.1.3.2.1.3.6]

The substate 5GMM-DEREGISTERED.NO-SUPI is chosen in the UE, if the N1 mode is enabled and the UE has no valid subscriber data available (SIM/USIM not available, the SIM/USIM is considered invalid by the UE).

[TS 24.501, subclause 5.3.2]

A UE supporting NG-RAN includes a PEI:

- a) when neither SUPI nor valid 5G-GUTI is available to use for emergency services in the REGISTRATION REQUEST message with 5GS registration type IE set to "emergency registration"; and

[TS 24.501, subclause 5.4.2.3]

If the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session and the SECURITY MODE COMMAND message is received with ngKSI value "000" and 5G-IA0 and 5G-EA0 as selected 5G NAS security algorithms, the UE shall locally derive and take in use 5G NAS security context. The UE shall delete existing current 5G NAS security context.

The UE shall accept a SECURITY MODE COMMAND message indicating the "null integrity protection algorithm" 5G-EA0 as the selected 5G NAS integrity algorithm only if the message is received when the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session.

[TS 24.501, subclause 5.5.1.2.2]

The UE in state 5GMM-DEREGISTERED shall initiate the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF,

...

- b) when the UE performs initial registration for emergency services;

...

If the UE initiates an initial registration for emergency services or needs to prolong the established NAS signalling connection after the completion of the initial registration procedure (e.g. due to uplink signalling pending), the UE shall set the Follow-on request indicator to 1.

[TS 24.501, subclause 6.4.1.2]

In order to initiate the UE-requested PDU session establishment procedure, the UE shall create a PDU SESSION ESTABLISHMENT REQUEST message.



NOTE 0: When IMS voice is available over either 3GPP access or non-3GPP access, the "voice centric" UE in 5GMM-REGISTERED state will receive a request from upper layers to establish the PDU session for IMS signalling, if the conditions for performing an initial registration with IMS indicated in 3GPP TS 24.229 [14] subclause U.3.1.2 are satisfied.

If the UE requests to establish a new PDU session, the UE shall allocate a PDU session ID which is not currently being used by another PDU session over either 3GPP access or non-3GPP access.

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION ESTABLISHMENT REQUEST message to the allocated PTI value.

...

If the UE requests to establish a new emergency PDU session, the UE shall set the SSC mode IE of the PDU SESSION ESTABLISHMENT REQUEST message to "SSC mode 1".

...

The UE shall transport:

- a) the PDU SESSION ESTABLISHMENT REQUEST message;
- b) the PDU session ID of the PDU session being established, or being handed over or being transferred;
- ..
- e) the request type which is set to:
  - ...
  - 3) "initial emergency request", if the UE requests to establish a new emergency PDU session; and

...

If the request type is set to "initial emergency request" or "existing emergency PDU session", neither DNN nor S-NSSAI is transported by the UE using the NAS transport procedure as specified in subclause 5.4.5.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.

**11.4.3.3                    Test description**

**11.4.3.3.1                Pre-test conditions**

**System Simulator:**

- 1 NR Cells
- NR Cell 1, as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates ims-EmergencySupport.

UE:

- The UE is NOT equipped with USIM.

Preamble:

- The UE is in test state 0N-B (Switched Off) as defined in TS 38.508-1 [4], subclause 4.4A.2.

11.4.3.3.2 Test procedure sequence

Table 11.4.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Switch the UE on.	-	-	-	-
2	Make the UE attempt an IMS emergency call dialling a number which is stored on the ME (e.g. 112 or 911). (NOTE 1)	-	-	-	-
3	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment without IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.12?	-	-	1	-
4	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
5	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
6	Start Timer=10 sec. NOTE: This is an arbitrary value to wait for UE initiated detach.	-	-	-	-
-	EXCEPTION: Steps 7a1-7b1 describes optional behaviour that depends on the UE implementation.	-	-	-	-
7a1	The UE transmits a DEREGISTRATION REQUEST message with De-registration type IE set to "Normal de-registration".	-->	NR RRC: <i>ULInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
7a2	The UE transmits a DEREGISTRATION ACCEPT message.	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
7a3	Stop Timer=10.	-	-	-	-
7b1	Timer=10 sec expires	-	-	-	-
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.3.3.3 Specific message contents

Table 11.4.3.3.3-1: REGISTRATION REQUEST (step 3, Table 11.4.3.3.2-1; step 3, TS 38.508-1 [4], Table 4.9.12.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6, condition EMERGENCY.			
Information Element	Value/remark	Comment	Condition
5GS mobile identity	PEI		

Table 11.4.3.3.3-2: DEREGISTRATION REQUEST (Step 7a1, Table 11.4.3.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-12, Condition NORMAL.

11.4.4

5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE  
T3346 running / Emergency call establishment / 5GMM-  
REGISTERED.NORMAL-SERVICE / Emergency call  
establishment before T3396 expiry

11.4.4.1

Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE state, timer T3346 is running and 5GMM-IDLE mode }

ensure that {

    when { UE is requested to make an Emergency call }

        then { UE initiates the registration procedure for mobility and periodic registration update, and, establishes the Emergency call }

    }

(2)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state, timer T3396 is running and 5GMM-IDLE mode }

ensure that {

    when { UE is requested to make an Emergency call }

        then { UE establishes the Emergency call }

    }

11.4.4.2

Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 5.5.1.3.5, 5.3.9, 5.5.1.3.2, 6.3.3.3, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 5.5.1.3.5]

If the mobility and periodic registration update request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

...

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

#22 (Congestion).

If the T3346 value IE is present in the REGISTRATION REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall proceed as described below, otherwise it shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.3.7.

The UE shall abort the registration procedure for mobility and periodic registration update. If the rejected request was not for initiating an emergency PDU session, the UE shall set the 5GS update status to 5U2 NOT UPDATED and change to state 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE.

The UE shall stop timer T3346 if it is running.

If the REGISTRATION REJECT message is integrity protected, the UE shall start timer T3346 with the value provided in the T3346 value IE.

...

The UE stays in the current serving cell and applies the normal cell reselection process. The registration procedure for mobility and periodic registration update is started, if still necessary, when timer T3346 expires or is stopped.

[TS 24.501, subclause 5.3.9]

If timer T3346 is running or is deactivated, and the UE is a UE configured for high priority access in selected PLMN, or the UE needs to initiate signalling for emergency services or emergency services fallback, then the UE is allowed to initiate 5GMM procedures.

[TS 24.501, subclause 5.5.1.3.2]

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

...

- k) when the UE in state 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE receives a request from the upper layers to establish an emergency PDU session or perform emergency services fallback;

[TS 24.501, subclause 6.3.3.3]

Upon receipt of a PDU SESSION RELEASE COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE considers the PDU session as released and the UE shall create a PDU SESSION RELEASE COMPLETE message.

...

If the PDU SESSION RELEASE COMMAND message includes 5GSM cause #26 "insufficient resources" and the Back-off timer value IE, the UE shall ignore the 5GSM congestion re-attempt indicator IE provided by the network, if any, and the UE shall take different actions depending on the timer value received for timer T3396 in the Back-off timer value:

...

When the timer T3396 is running or the timer is deactivated, the UE is allowed to initiate a PDU session establishment procedure for emergency services.

...

The UE shall set the Follow-on request indicator to 1, if the UE:

- a) initiates the mobility and periodic registration updating procedure upon request of the upper layers to establish an emergency PDU session;

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.
- b) Any emergency call number stored on a SIM/USIM when the SIM/USIM is present.
- c) 000, 08, 110, 999, 118 and 119 when a SIM/USIM is not present. These numbers shall be stored on the ME.
- d) Additional emergency call numbers that may have been downloaded by the serving network when the SIM/USIM is present.

11.4.4.3

Test description

11.4.4.3.1

Pre-test conditions

System Simulator:

- 2 NR Cells
  - NR Cell 1 and NR Cell 11 as defined in TS 38.508-1 [4] Table 4.4.2-3.
  - On all cells when active: System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates ims-EmergencySupport.

UE:

None.

Preamble:

- Cells power level configuration in accordance with TS 38.508-1 [4], Table 6.2.2.1-3:
  - NR Cell 1 "Serving cell"
  - NR Cell 11 "Non-Suitable "Off" cell"
- The UE is in test state 1N-A as defined in TS 38.508-1 [4], subclause 4.4A.2 on NR Cell 1
  - During the initial registration:
    - The list of tracking areas provided by the AMF (IE "TAI list") contains only the TAI of NR Cell 1.

11.4.4.3.2

Test procedure sequence

Table 11.4.4.3.2-1: Main behaviour

St	Procedure	Message Sequence	T P	Verdict

		U - S	Message		
--	--	-------	---------	--	--

1	The SS configures: - NR Cell 11 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell".	-	-	-	-
-	The following messages are to be observed on NR Cell 11 unless explicitly stated otherwise.	-	-	-	-
2	The UE transmits an <i>RRCCConnectionRequest</i> message.	-->	NR RRC: <i>RRCCSetupRequest</i>	-	-
3	SS transmit an <i>RRCCConnectionSetup</i> message.	<--	NR RRC: <i>RRCCSetup</i>	-	-
4	The UE transmits an <i>RRCCConnectionSetupComplete</i> message to confirm the successful completion of the connection establishment and a REGISTRATION REQUEST message indicating "mobility registration updating" is sent to update the registration of the actual tracking area.	-->	NR RRC: <i>RRCCSetupComplete</i> 5GMM: REGISTRATION REQUEST	-	-
5	SS sends a REGISTRATION REJECT message containing 5GMM cause value = #22 (Congestion).	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: REGISTRATION REJECT	-	-
6	The SS transmits an <i>RRCCConnectionRelease</i> message.	<--	NR RRC: <i>RRCCRelease</i>	-	-
7	Make the UE attempt an IMS emergency call dialling an emergency number e.g. 112 or 911). (NOTE 1)	-	-	-	-
8	Check: Does the UE perform the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5, 'connected without release'?	-	-	1	-
8A	Check: Does the UE transmit an UL NAS TRANSPORT message with 'Request type' set to 'initial emergency request', and, a PDU SESSION ESTABLISHMENT REQUEST for establishing an emergency PDU?	-->	NR RRC: <i>ULInformationTransfer</i> 5GMM: UL NAS TRANSPORT 5GSM: PDU SESSION ESTABLISHMENT REQUEST	1	P
9-9D	Steps 9-13 from Generic Test Procedure for IMS Emergency call establishment with IMS Emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11, including the parallel behaviour specified in table 4.9.11.2.2-2 are performed.	-	-	-	-
10	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
11	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
-	EXCEPTION: Steps 12-13 below are repeated pc_noOf_PDUs times. The SS releases all active PDUs due to insufficient resources.	-	-	-	-
12	The generic test procedure in TS 38.508-1 clause 4.9.21 for PDU Session Release is performed with a PDU SESSION RELEASE COMMAND including 5GSM cause #26 "insufficient resources", and, Back-off timer value IE, which provides the value of the T3396, set to a value which is neither zero nor a value which indicates that the timer is deactivated.	-	-	-	-
13	Void	-	-	-	-
14	The SS releases the RRC connection.	-	NR RRC: <i>RRCCRelease</i>	-	-
15	Make the UE attempt an IMS emergency call	-	-	-	-

	dialling an emergency number e.g. 112 or 911). (NOTE 1)				
16	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS Emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	2	-
17	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
18	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.4.3.3 Specific message contents

Table 11.4.4.3.3-0: REGISTRATION REQUEST (step 4, Table 11.4.4.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6, Condition MOBILITY.
--

Table 11.4.4.3.3-1: REGISTRATION REJECT (step 5, Table 11.4.4.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-9			
Information Element	Value/remark	Comment	Condition
5GMM cause	'00010110'B	#22 (Congestion)	
T3346 value	'00100011'B	3 minutes	

Table 11.4.4.3.3-2: REGISTRATION REQUEST (step 8, Table 11.4.4.3.2-1; step 3, TS 38.508-1 [4] Table 4.9.5.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6, Condition EMERGENCY.
---

Table 11.4.4.3.3-3: UL NAS TRANSPORT (step 8A, Table 11.4.4.3.2-1)

Derivation Path: Table 4.7.1-10, condition INITIAL_PDU_REQUEST.			
Information Element	Value/remark	Comment	Condition
Request type	'011'B	initial emergency request	
S-NSSAI	Not Present		
DNN	Not Present		

Table 11.4.4.3.3-4: PDU SESSION ESTABLISHMENT REQUEST (step 8A, Table 11.4.4.3.2-1)

Derivation Path: Table 4.7.2-1.			
Information Element	Value/remark	Comment	Condition
PDU session ID	A value that is not currently being used by another PDU session		
PTI	A value currently not used		
SSC mode	'001'B	SSC mode 1	



Table 11.4.4.3.3-5: PDU SESSION RELEASE COMMAND (step 12, Table 11.4.4.3.2-1; step 1, TS 36.508 [4] Table 4.9.21.2.2-1)

Derivation Path: TS 38.508-1 [4] Table 4.7.2-14			
Information Element	Value/remark	Comment	Condition
PDU session ID	An ID of an existing PDU session		
5GSM cause	'0001 1010'B	insufficient resources	
Back-off timer value	'1010 0101'B	5 minutes	

11.4.5

5GMM-REGISTERED.LIMITED-SERVICE / 5GMM-IDLE /  
Emergency call establishment and release / Handling of 5GS  
forbidden tracking areas for roaming

11.4.5.1

Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.LIMITED-SERVICE state and 5GMM-IDLE mode }

ensure that {

    when { UE is requested to make an Emergency call }

        then { UE establishes the Emergency call }

    }

(2)

with { UE in 5GMM-REGISTERED.LIMITED-SERVICE state and 5GMM-IDLE mode having established an Emergency call }

ensure that {

    when { UE is requested to release the Emergency call }

        then { UE releases the Emergency call, and, the UE considers the current cell as belonging to 5GS forbidden tracking areas for roaming }

    }

11.4.5.2

Conformance requirement

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 5.5.1.3.5, TS 23.122 [38], subclause 3.4.2. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 5.5.1.3.5]

#15    (No suitable cells in tracking area).

        The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2). The UE shall reset the registration attempt counter and shall enter the state 5GMM-

REGISTERED.LIMITED-SERVICE. The UE shall search for a suitable cell in another tracking area according to 3GPP TS 38.304 [28].

The UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and shall remove the current TAI from the stored TAI list, if present.

If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status and tracking area updating attempt counter as specified in 3GPP TS 24.301 [15] for the case when the normal tracking area updating procedure is rejected with the EMM cause with the same value.

[TS 23.122, subclause 3.4.2]

The MS is not allowed to request 5GS services except emergency services when camped on a cell of a TA of which belongs to the list of "5GS forbidden tracking areas for regional provision of service".

11.4.5.3

Test description

11.4.5.3.1

Pre-test conditions

System Simulator:

- 3 NR Cells
- NR Cell 1, NR Cell 2 and NR Cell 11 as defined in TS 38.508-1 [4], Table 4.4.2-3.
- Maximum of 2 cells are active at any point of time.
- On all cells when active: System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates ims-EmergencySupport.

UE:

None.

Preamble:

- Cell configuration " in accordance with TS 38.508-1 [4], Table 4.4.2-3:
- NR Cell 1 "Serving cell"
- NR Cell 2 "Non-Suitable "Off" cell"
- NR Cell 11 "Non-Suitable "Off" cell"
- The UE is in test state 1N-A as defined in TS 38.508-1 [4], subclause 4.4A.2 on NR Cell 1
- During the initial registration:
  - In the list of tracking areas provided by the AMF (IE 'TAI list') contains only the TAI of NR Cell 1.

11.4.5.3.2

Test procedure sequence

Table 11.4.5.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		

1	The SS configures: - NR Cell 11 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 2 as "Non-Suitable "Off" cell".	-	-	-	-
-	EXCEPTION: The following messages are to be observed on NR Cell 11 unless explicitly stated otherwise.	-	-	-	-
2	The UE transmits an <i>RRCCConnectionRequest</i> message.	-->	NR RRC: <i>RRCCSetupRequest</i>	-	-
3	SS transmit an <i>RRCCConnectionSetup</i> message.	<--	NR RRC: <i>RRCCSetup</i>	-	-
4	The UE transmits an <i>RRCCConnectionSetupComplete</i> message to confirm the successful completion of the connection establishment and a REGISTRATION REQUEST message indicating "mobility registration updating" is sent to update the registration of the actual tracking area.	-->	NR RRC: <i>RRCCSetupComplete</i> 5GMM: REGISTRATION REQUEST	-	-
5	SS sends a REGISTRATION REJECT message containing 5GMM cause value = #15 (No suitable cells in tracking area).	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: REGISTRATION REJECT	-	-
6	The SS transmits an <i>RRCCConnectionRelease</i> message.	<--	NR RRC: <i>RRCCRelease</i>	-	-
7	Make the UE attempt an IMS emergency call dialling an emergency number e.g. 112 or 911). (NOTE 1)	-	-	-	-
8	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS Emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	1	-
9	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
10	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
11	The SS transmits an <i>RRCCConnectionRelease</i> message.	<--	NR RRC: <i>RRCCRelease</i>	-	-
12	Check: Does the UE respond to paging (the Generic Test Procedure for no response to paging as specified in TS 38.508-1 [4], subclause 4.9.13 is performed)?	-	-	2	-
13	The SS configures: - NR Cell 2 as "Serving cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 1 as "Non-Suitable "Off" cell".	-	-	-	-
14	Check: Does the UE perform on NR Cell 2 the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5, ' <i>connected without release</i> '?	-	-	2	-

NOTE 1: This could be done by e.g. MMI or AT command.

11.4.5.3.3 Specific message contents

Table 11.4.5.3.3-1: REGISTRATION REJECT (step 5, Table 11.4.5.3.2-1)

Derivation path: TS 38.508-1 [4] table 4.7.1-9			
Information Element	Value/remark	Comment	Condition

5GMM cause	'00001111'B	#15 (No suitable cells in tracking area).	
------------	-------------	---	--

11.4.6 5GMM-REGISTERED.NON-ALLOWED-SERVICE / Emergency call establishment and release / Handling of non-allowed tracking areas

11.4.6.1 Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.NON-ALLOWED-SERVICE state and 5GMM-IDLE mode }  
  
ensure that {  
  
    when { UE is requested to make an Emergency call }  
  
        then { UE establishes the Emergency call }  
  
}

(2)

with { UE in 5GMM-REGISTERED.NON-ALLOWED-SERVICE state and 5GMM-CONNECTED mode having established an Emergency call }  
  
ensure that {  
  
    when { UE is requested to release the Emergency call }  
  
        then { UE releases the Emergency call, and, the UE considers the current cell as belonging to non-allowed tracking areas }  
  
}

11.4.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 5.3.5, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 5.3.5]

When the UE receives a Service area list IE with a non-allowed area indication during a registration procedure or a generic UE configuration update procedure, the UE shall delete the old list of "non-allowed tracking areas" and store the tracking areas in the non-allowed area as the list of "non-allowed tracking areas". If the UE has a stored list of "allowed tracking areas", the UE shall delete that list.

...

If the UE is successfully registered to a PLMN and has a stored list of "non-allowed tracking areas":

...

- b) while camped on a cell whose TAI is in the list of "non-allowed tracking areas", the UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE, and:
  - 1) if the UE is in 5GMM-IDLE mode over 3GPP access, the UE:
    - ...
    - ii) shall not initiate a service request procedure except for emergency services, high priority access, responding to paging or notification or indicating a change of 3GPP PS data off UE status; and

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.
- b) Any emergency call number stored on a SIM/USIM when the SIM/USIM is present.
- c) 000, 08, 110, 999, 118 and 119 when a SIM/USIM is not present. These numbers shall be stored on the ME.
- d) Additional emergency call numbers that may have been downloaded by the serving network when the SIM/USIM is present.

**11.4.6.3                    Test description**

**11.4.6.3.1                Pre-test conditions**

**System Simulator:**

- 3 NR Cells
  - NR Cell 1, NR Cell 2 and NR Cell 11 as defined in TS 38.508-1 [4] Table 4.4.2-3.
  - Maximum of 2 cells are active at any point of time.
  - On all cells when active: System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates ims-EmergencySupport.

**UE:**

None.

**Preamble:**

- Cells power level configuration in accordance with TS 38.508-1 [4], Table 6.2.2.1-3:
  - NR Cell 1 "Serving cell"
  - NR Cell 2 "Non-Suitable "Off" cell"
  - NR Cell 11 "Non-Suitable "Off" cell"
- The UE is in test state 1N-A as defined in TS 38.508-1 [4], subclause 4.4A.2 on NR Cell 1
  - During the initial registration:

- The list of tracking areas provided by the AMF (IE "TAI list") contains only the TAI of NR Cell 1 whereas the TAI of NR Cell 11 is indicated in the Service area list IE with non-allowed areas as specified in Table 11.4.6.3.3-2.

11.4.6.3.2

Test procedure sequence

Table 11.4.6.3.2-1: Main behaviour

St	Procedure	Message Sequence		T P	Verdict
		U - S	Message		
1	The SS configures: - NR Cell 11 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 2 as "Non-Suitable "Off" cell".	-	-	-	-
-	The following messages are to be observed on NR Cell 11 unless explicitly stated otherwise.	-	-	-	-
2	Check: Does in the next 5 sec the UE transmit an <i>RRCSetupRequest</i> message?	-->	NR RRC: <i>RRCSetupRequest</i>	1	F
3	Make the UE attempt an IMS emergency call dialling an emergency number e.g. 112 or 911. (NOTE 1)	-	-	-	-
4	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS Emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	1	-
5	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
6	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
6	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
7	Make the UE attempt an IMS none-emergency call. (NOTE 1)				
8	Check: Does the UE transmit in the next 10 sec an <i>RRCSetupRequest</i> message?	-->	NR RRC: <i>RRCSetupRequest</i>	2	F
9	The SS configures: - NR Cell 2 as "Serving cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 1 as "Non-Suitable "Off" cell".	-	-	-	-
10	Check: Does the UE perform on NR Cell 2 the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5, ' <i>connected without release</i> '?	-	-	2	-
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.6.3.3

Specific message contents

Table 11.4.6.3.3-2: REGISTRATION ACCEPT (Preamble)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

Service area list			
Allowed type (octet 1)	'1'B	TAs in the list are in the non-allowed area	
Type of list (octet 1)	'00'B	list of TACs belonging to one PLMN, with non-consecutive TAC values	
Number of elements (octet 1)	'00000'B	1 element	
MCC	As defined for NR Cell 11 in TS 38.508-1 [4], Table 4.4.2-3.		
MNC	As defined for NR Cell 11 in TS 38.508-1 [4], Table 4.4.2-3.		
TAC 1	As defined for NR Cell 11 in TS 38.508-1 [4], Table 4.4.2-3.		

11.4.7 Handling of Local and Extended emergency numbers / Mobility

11.4.7.1 Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, UE receives a Local emergency numbers list in the REGISTRATION ACCEPT message, provided in the Emergency number list IE }

ensure that {

when { UE is requested to make an outgoing call using any of the emergency numbers received in the Local emergency numbers list }

then { UE establishes an IMS Emergency call }

}

(2)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, UE receives an Extended local emergency numbers list in the REGISTRATION ACCEPT message, provided in the Extended emergency number list IE }

ensure that {

when { UE is requested to make an outgoing call using any of the emergency numbers received in the Extended local emergency numbers list }

then { UE establishes an IMS Emergency call }

}

(3)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list and an Extended local emergency numbers list }

**ensure that** {

**when** { UE receives a new Local emergency numbers list in the REGISTRATION ACCEPT message, provided in the Emergency number list IE }

**then** { UE replaces the previously stored Local emergency numbers list }

    }

**(4)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list and an Extended local emergency numbers list }

**ensure that** {

**when** { UE receives a new Extended local emergency numbers list, in the REGISTRATION ACCEPT message, provided in the Extended emergency number list IE }

**then** { UE replaces the previously stored Extended local emergency numbers list }

    }

**(5)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list }

**ensure that** {

**when** { UE moves within the same PLMN from which the currently stored Local emergency numbers list provided in an Emergency number list IE were received, and, no Emergency number list IE is contained in the REGISTRATION ACCEPT message received during a Mobility and periodic update procedure }

**then** { UE keeps the stored Local emergency numbers list in the user equipment }

    }

**(6)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored an Extended local emergency numbers list }

**ensure that** {

**when** { UE moves within the same PLMN from which the currently stored Extended local Emergency Numbers List provided in an Extended emergency number list IE were received, and, no Extended emergency number list IE is contained in the REGISTRATION ACCEPT message received during a Mobility and periodic update procedure }

**then** { UE keeps the stored Extended local Emergency Numbers List in the user equipment }

    }

**(7)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list }



**ensure that {**

**when** { UE moves to a new PLMN in the same country as the PLMN from which the currently stored Local emergency numbers list provided in an Emergency number list IE were received, and, no Emergency number list IE is contained in the REGISTRATION ACCEPT message received in the new PLMN }

**then** { UE keeps the stored Local emergency numbers list in the user equipment }

**}**

**(8)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored an Extended local emergency numbers list }

**ensure that {**

**when** { UE moves to a new PLMN in the same country as the PLMN from which the currently stored Extended Emergency Numbers List provided in an Extended emergency number list IE were received, and the Extended Emergency Number List Validity (EENLV) field within the Extended emergency number list IE indicated "Extended local Emergency Numbers List is valid in the country of the PLMN from which this IE is received", and, no Extended emergency number list IE is contained in the REGISTRATION ACCEPT message received in the new PLMN }

**then** { UE keeps the stored Extended local Emergency Numbers List in the user equipment }

**}**

**(9)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list and an Extended local emergency numbers list }

**ensure that {**

**when** { UE moves to a new PLMN in the same country as the PLMN from which the currently stored Extended Emergency Numbers List provided in an Extended emergency number list IE were received, and the Extended Emergency Number List Validity (EENLV) field within the Extended emergency number list IE indicated "Extended local Emergency Numbers List is valid only in the PLMN from which this IE is received", and, no Extended emergency number list IE is contained in the REGISTRATION ACCEPT message received in the new PLMN }

**then** { UE deletes the stored Extended local Emergency Numbers List, **and**, keeps the stored Local emergency numbers list in the user equipment }

**}**

**(10)**

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list }

**ensure that {**

**when** { UE moves to a new PLMN in a different country as the PLMN from which the currently stored Local emergency numbers list provided in an Emergency number list IE was received, and, no Emergency number list IE is contained in the REGISTRATION ACCEPT message received in the new PLMN }

**then** { UE deletes the stored Local emergency numbers list in the user equipment }

**}**

(11)

**with** { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored an Extended local emergency numbers list }

**ensure that** {

**when** { UE moves to a new PLMN in a different country as the PLMN from which the currently stored Extended Emergency Numbers List provided in an Extended emergency number list IE were, and, no Extended emergency number list IE is contained in the REGISTRATION ACCEPT message received in the new PLMN }

**then** { UE deletes the stored Extended emergency numbers list in the user equipment }

}

**11.4.7.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 38.331 [12], subclause 5.3.3.3, TS 24.501 [22], subclause 5.3.12, TS 24.301 [21], subclause 5.3.7, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 38.331, subclause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

...

1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

[TS 24.501, subclause 5.3.12]

The network may send a Local emergency numbers list or an Extended local emergency numbers list or both, in the REGISTRATION ACCEPT message, by including the Emergency number list IE and the Extended emergency number list IE, respectively. The Local emergency numbers list can be updated as described in 3GPP TS 24.301 [15], subclause 5.3.7.

The user equipment shall store the Local emergency numbers list and the Extended local emergency numbers list, as provided by the network. The Local emergency numbers list stored in the user equipment shall be replaced on each receipt of the Emergency number list IE. The Extended local emergency numbers list stored in the user equipment shall be replaced on each receipt of the Extended emergency number list IE. The received Local emergency numbers list or the received Extended local emergency numbers list or both shall be provided to the upper layers.

...

The emergency number(s) received in the Emergency number list IE are valid only in networks in the same country as the PLMN from which this IE is received. If no Emergency number list IE is contained in the REGISTRATION ACCEPT message, then the stored Local emergency numbers list in the user equipment shall be kept, except if the user equipment has successfully registered to a PLMN in a country different from that of the PLMN that sent the list.

The emergency number(s) received in the Extended emergency number list IE are valid only in:

- networks in the same country as the PLMN from which this IE is received, if the Extended Emergency Number List Validity (EENLV) field within the Extended emergency number list IE indicates "Extended local Emergency Numbers List is valid in the country of the PLMN from which this IE is received"; and

- the PLMN from which this IE is received, if the EENLV field within the Extended emergency number list IE indicates "Extended local Emergency Numbers List is valid only in the PLMN from which this IE is received".

If no Extended local Emergency Numbers List is contained in the REGISTRATION ACCEPT message, and the registered PLMN has not changed, then the stored Extended local Emergency Numbers List in the user equipment shall be kept. If no Extended local Emergency Numbers List is contained in the REGISTRATION ACCEPT message, but the registered PLMN has changed, then:

- if the last received indication in the EENLV field within the Extended emergency number list IE indicates "Extended local Emergency Numbers List is valid only in the PLMN from which this IE is received", the stored Extended local Emergency Numbers List in the user equipment shall be deleted; and
- if the last received indication in the EENLV field within the Extended emergency number list IE indicates "Extended local Emergency Numbers List is valid in the country of the PLMN from which this IE is received" the list shall be kept except if the user equipment has successfully registered to a PLMN in a country different from that of the PLMN that sent the stored list.

NOTE: To prevent the misrouting of emergency calls, all operators within a country need to follow the regulation or agree on the setting of the Extended emergency number list IE in accordance to national agreement – either to indicate validity within a country or to indicate validity only within the PLMN.

The Local emergency numbers list and the Extended local emergency numbers list shall be deleted at switch off or removal of the USIM. The user equipment shall be able to store up to ten entries in the Local emergency numbers list and up to twenty entries in the Extended local emergency numbers list, received from the network.

For the use of the Local emergency numbers list and the Extended local emergency numbers list by the UE see 3GPP TS 24.301 [15], subclause 5.3.7.

[TS 24.301, subclause 5.3.7]

The Local Emergency Numbers List and the Extended local Emergency Numbers list contain additional Local emergency numbers used by the serving network. These lists can be downloaded by the network to the UE at successful registration and subsequent registration updates. There is only one Local Emergency Numbers List and only one Extended local Emergency Numbers list in the UE. The Local Emergency Numbers List can be updated with EMM procedures if the UE is in S1 mode, with GMM and MM procedures if the UE is in A/Gb or Iu mode, and with 5GMM procedures, as specified in 3GPP TS 24.501 [54], if UE is in N1 mode. The Extended local Emergency Numbers List can be updated with EMM procedures if the UE is in S1 mode and with 5GMM procedures, as specified in 3GPP TS 24.501 [54], if UE is in N1 mode.

The UE shall use the stored Local Emergency Numbers List and the stored Extended local Emergency Numbers List received from the network in addition to the emergency numbers stored on the USIM or user equipment to detect that the number dialled is an emergency number.

If the UE determines that the number dialled is an emergency number, the procedures specified in 3GPP TS 23.167 [45] and 3GPP TS 24.229 [13D] are utilised to select a domain for the emergency session attempt.

If the domain selected for the emergency session attempt is the PS domain, then the UE shall perform the session establishment procedures specified in 3GPP TS 24.229 [13D] to initiate an emergency session.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.

- b) Any emergency call number stored on a SIM/USIM when the SIM/USIM is present.
- c) 000, 08, 110, 999, 118 and 119 when a SIM/USIM is not present. These numbers shall be stored on the ME.
- d) Additional emergency call numbers that may have been downloaded by the serving network when the SIM/USIM is present.

11.4.7.3 Test description

11.4.7.3.1 Pre-test conditions

System Simulator:

- 4 NR Cells
- NR Cell 1, NR Cell 3, NR Cell 11, NR Cell 12 as defined in TS 38.508-1 [4], Table 4.4.2-3, with the exception that cells' PLMNs are defined in Table 11.4.7.3.1-1 below.

Table 11.4.7.3.1-1: PLMN identifiers

NR Cell	PLMN name
1	PLMN1
3	PLMN15
11	PLMN1
12	PLMN2
NOTE 1: PLMN1 is stored in EF <sub>IMSI</sub> on the test USIM card. NOTE 2: PLMN1 and PLMN15 are in the same country; PLMN2 is in a different country.	

- System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates *ims-EmergencySupport*.

NOTE: No more than 2 cells are active simultaneously at any time throughout the test.

UE:

- The UE is equipped with a test USIM with USIM Configuration 20 as defined in TS 38.508-1 [4] Table 6.4.1-20 (USIM contains two Emergency Numbers: 144, 117).

Preamble:

- Cells signal level in accordance with TS 38.508-1 [4], Table 6.2.2.1-3:
  - NR Cell 12 "Serving cell"
  - NR Cell 1 "Non-Suitable "Off" cell"
  - NR Cell 11 "Non-Suitable "Off" cell"
  - NR Cell 3 "Non-Suitable "Off" cell"
- The UE is in test state 1N-A as defined in TS 38.508-1 [4], subclause 4.4A.2 on NR Cell 12.
- During the initial registration:
  - Local emergency number(s) and Extended local emergency number(s) are provided by the Network as specified in Table 11.4.7.3.3-1.

11.4.7.3.2

Test procedure sequence

Table 11.4.7.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

-	The following messages are to be observed on NR Cell 12 unless explicitly stated otherwise.	-	-	-	-
1	Make the UE attempt an IMS call dialling number 120. (NOTE 1) The number is expected to be stored in the Local emergency number list being received in the REGISTRATION ACCEPT message in the Preamble.	-	-	-	-
2	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	1	-
3	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
4	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
5	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
6	Make the UE attempt an IMS call dialling number 10. (NOTE 1) The number is expected to be stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in the Preamble.	-	-	-	-
7	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	2	-
8	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
9	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
10	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The SS configures: - NR Cell 1 as "Serving cell" - NR Cell 12 as "Non-Suitable "Off" cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 3 as "Non-Suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
11	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the Network provides new Local emergency number list and Extended local emergency number list (EENLV=Extended Local Emergency Numbers List is valid in the country of the PLMN from which this IE is received) in the REGISTRATION ACCEPT message.	-	-	-	-
12	Make the UE attempt an IMS call dialling number 1001. (NOTE 1) The number is expected to be stored in the Local emergency number list being received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
13	Check: Does the UE performs Generic Test Procedure for IMS Emergency call	-	-	3	-

	establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?				
--	--	--	--	--	--

14	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
15	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
16	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
17	Make the UE attempt an IMS call dialling number 120. (NOTE 1) The number was initially stored in the Local emergency number list being received in the REGISTRATION ACCEPT message in the Preamble but is expected to have been removed from the list when a new list was received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
18	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	3	-
19	Make the UE release the call. (NOTE 1)	-	-	-	-
20	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
21	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
22	Make the UE attempt an IMS call dialling number 12345. (NOTE 1) The number is expected to be stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
23	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	4	-
24	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
25	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
26	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
27	Make the UE attempt an IMS call dialling number 10. (NOTE 1) The number was initially stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in the Preamble but is expected to have been removed from the list when a new list was received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
28	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	4	-
29	Make the UE release the call. (NOTE 1)	-	-	-	-
30	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
31	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The SS configures: - NR Cell 11 as "Serving cell"	-	-	-	-



	- NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 12 as "Non-Suitable "Off" cell" - NR Cell 3 as "Non-Suitable "Off" cell"				
--	---	--	--	--	--

-	The following messages are to be observed on NR Cell 11 unless explicitly stated otherwise.	-	-	-	-
32	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the Network does not send new Local emergency number list and Extended local emergency number list in the REGISTRATION ACCEPT message.	-	-	-	-
33	Make the UE attempt an IMS call dialling number 1001. (NOTE 1) The number is expected to be stored in the Local emergency number list being received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
34	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	5	-
35	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
36	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
37	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
38	Make the UE attempt an IMS call dialling number 12345. (NOTE 1) The number is expected to be stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
39	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	6	-
40	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
41	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
42	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The SS configures: - NR Cell 3 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 12 as "Non-Suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NR Cell 3 unless explicitly stated otherwise.	-	-	-	-
43	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the Network does not send new Local emergency number list and Extended local emergency number list in the REGISTRATION ACCEPT message.	-	-	-	-
44	Make the UE attempt an IMS call dialling number 1001. (NOTE 1) The number is expected to be stored in the Local emergency number list being received in	-	-	-	-

	the REGISTRATION ACCEPT message in step 11.				
--	---	--	--	--	--

45	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	7	-
46	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
47	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
48	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
49	Make the UE attempt an IMS call dialling number 12345. (NOTE 1) The number is expected to be stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in step 11.	-	-	-	-
50	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	8	-
51	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
52	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
53	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The SS configures: - NR Cell 12 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 3 as "Non-Suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NR Cell 12 unless explicitly stated otherwise.	-	-	-	-
54	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the Network does not send new Local emergency number list and Extended local emergency number list in the REGISTRATION ACCEPT message.	-	-	-	-
55	Make the UE attempt an IMS call dialling number 1001. (NOTE 1) The number was initially stored in the Local emergency number list being received in the REGISTRATION ACCEPT message in step 11 but is expected to have been removed from the list when no new list was received in the REGISTRATION ACCEPT message in step 54.	-	-	-	-
56	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	10	-
57	Make the UE release the call. (NOTE 1)	-	-	-	-
58	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
59	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
60	Make the UE attempt an IMS call dialling	-	-	-	-

	number 12345. (NOTE 1) The number was initially stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in step 11 but is expected to have been removed from the list when no new list was received in the REGISTRATION ACCEPT message in step 54.				
--	--	--	--	--	--

61	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	11	-
62	Make the UE release the call. (NOTE 1)	-	-	-	-
63	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
64	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The SS configures: - NR Cell 1 as "Serving cell" - NR Cell 12 as "Non-Suitable "Off" cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 3 as "Non-Suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
65	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the Network provides new Local emergency number list and Extended local emergency number list (EENLV=Extended Local Emergency Numbers List is valid in the PLMN from which this IE is received) in the REGISTRATION ACCEPT message.	-	-	-	-
-	The SS configures: - NR Cell 3 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell" - NR Cell 11 as "Non-Suitable "Off" cell" - NR Cell 12 as "Non-Suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NR Cell 3 unless explicitly stated otherwise.	-	-	-	-
66	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the Network does not send new Local emergency number list and Extended local emergency number list in the REGISTRATION ACCEPT message.	-	-	-	-
67	Make the UE attempt an IMS call dialling number 12345. (NOTE 1) The number was initially stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in step 65 but is expected to have been removed from the list when no new list was received in the REGISTRATION ACCEPT message in step 66.	-	-	-	-
68	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	9	-
69	Make the UE release the call. (NOTE 1)	-	-	-	-
70	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
71	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
72	Make the UE attempt an IMS call dialling number 1001. (NOTE 1) The number was initially stored in the Local	-	-	-	-

	emergency number list being received in the REGISTRATION ACCEPT message in step 65 and is not expected to have been removed from the list when no new list was received in the REGISTRATION ACCEPT message in step 66.				
73	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	9	-
74	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
75	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
76	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.7.3.3 Specific message contents

Table 11.4.7.3.3-1: REGISTRATION ACCEPT (Preamble)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

Emergency number list			
Emergency Number information	120  TS 24.008 [43], 10.5.3.13.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	
Extended emergency number list			
EENLV	'0'	Extended Local Emergency Numbers List is valid in the country of the PLMN from which this IE is received	
Emergency Number information	10  TS 24.301 [21], 9.9.3.37A.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	

Table 11.4.7.3.3-2: REGISTRATION ACCEPT (step 11, Table 11.4.7.3.2-1; step 4, TS 38.508-1 [4], Table 4.9.5.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition



Emergency number list			
Emergency Number information	1 number: 1001  TS 24.008 [43], 10.5.3.13.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	
Extended emergency number list			
EENLV	'0'	Extended Local Emergency Numbers List is valid in the country of the PLMN from which this IE is received	
Emergency Number information	1 number: 12345  TS 24.301 [21], 9.9.3.37A.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	

Table 11.4.7.3.3-3: REGISTRATION ACCEPT (step 65, Table 11.4.7.3.2-1; step 4, TS 38.508-1 [4], Table 4.9.5.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

Emergency number list			
Emergency Number information	1 number: 1001  TS 24.008 [43], 10.5.3.13.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	
Extended emergency number list			
EENLV	'1'	Extended Local Emergency Numbers List is valid in the PLMN from which this IE is received	
Emergency Number information	1 number: 12345  TS 24.301 [21], 9.9.3.37A.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	

11.4.8 Handling of Local and extended emergency numbers / Switch-off and maximum local numbers storage

11.4.8.1 Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored a Local emergency numbers list }

ensure that {

    when { UE is switched off or the USIM is removed }

        then { UE deletes the stored Local emergency numbers list in the user equipment }

    }

(2)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, having stored an Extended local emergency numbers list }

ensure that {

```
when { UE is switched off or the USIM is removed }  
  
    then { UE deletes the stored Extended local Emergency Numbers List in the user equipment }  
  
}
```

(3)

```
with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, UE receives a Local emergency  
numbers list with 10 entries in the REGISTRATION ACCEPT message, provided in the Emergency number  
list IE and the UE has stored them in local emergency numbers list }  
  
ensure that {  
  
    when { UE is requested to make an outgoing call using any of the emergency numbers received in the  
Local emergency numbers list }  
  
        then { UE establishes an IMS Emergency call }  
  
}
```

(4)

```
with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode, UE receives an Extended local  
emergency numbers list with 20 entries, in the REGISTRATION ACCEPT message, provided in the Extended  
emergency number list IE and the UE has stored them in local emergency numbers lists }  
  
ensure that {  
  
    when { UE is requested to make an outgoing call using any of the emergency numbers received in the  
Extended local emergency numbers list }  
  
        then { UE establishes an IMS Emergency call }  
  
}
```

11.4.8.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331 [12], subclause 5.3.3.3, TS 24.501 [22], subclause 5.3.12, TS 24.301 [21], subclause 5.3.7, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 38.331, subclause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

```
...  
  
1> set the establishmentCause in accordance with the information received from upper layers;
```

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

[TS 24.501, subclause 5.3.12]

The network may send a Local emergency numbers list or an Extended local emergency numbers list or both, in the REGISTRATION ACCEPT message, by including the Emergency number list IE and the Extended emergency number list IE, respectively. The Local emergency numbers list can be updated as described in 3GPP TS 24.301 [15], subclause 5.3.7.

The user equipment shall store the Local emergency numbers list and the Extended local emergency numbers list, as provided by the network. The Local emergency numbers list stored in the user equipment shall be replaced on each receipt of the Emergency number list IE. The Extended local emergency numbers list stored in the user equipment shall be replaced on each receipt of the Extended emergency number list IE. The received Local emergency numbers list or the received Extended local emergency numbers list or both shall be provided to the upper layers.

...

The Local emergency numbers list and the Extended local emergency numbers list shall be deleted at switch off or removal of the USIM. The user equipment shall be able to store up to ten entries in the Local emergency numbers list and up to twenty entries in the Extended local emergency numbers list, received from the network.

For the use of the Local emergency numbers list and the Extended local emergency numbers list by the UE see 3GPP TS 24.301 [15], subclause 5.3.7.

[TS 24.301, subclause 5.3.7]

The Local Emergency Numbers List and the Extended local Emergency Numbers list contain additional Local emergency numbers used by the serving network. These lists can be downloaded by the network to the UE at successful registration and subsequent registration updates. There is only one Local Emergency Numbers List and only one Extended local Emergency Numbers list in the UE. The Local Emergency Numbers List can be updated with EMM procedures if the UE is in S1 mode, with GMM and MM procedures if the UE is in A/Gb or Iu mode, and with 5GMM procedures, as specified in 3GPP TS 24.501 [54], if UE is in N1 mode. The Extended local Emergency Numbers List can be updated with EMM procedures if the UE is in S1 mode and with 5GMM procedures, as specified in 3GPP TS 24.501 [54], if UE is in N1 mode.

The UE shall use the stored Local Emergency Numbers List and the stored Extended local Emergency Numbers List received from the network in addition to the emergency numbers stored on the USIM or user equipment to detect that the number dialled is an emergency number.

If the UE determines that the number dialled is an emergency number, the procedures specified in 3GPP TS 23.167 [45] and 3GPP TS 24.229 [13D] are utilised to select a domain for the emergency session attempt.

If the domain selected for the emergency session attempt is the PS domain, then the UE shall perform the session establishment procedures specified in 3GPP TS 24.229 [13D] to initiate an emergency session.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.
- b) Any emergency call number stored on a SIM/USIM when the SIM/USIM is present.
- c) 000, 08, 110, 999, 118 and 119 when a SIM/USIM is not present. These numbers shall be stored on the ME.
- d) Additional emergency call numbers that may have been downloaded by the serving network when the SIM/USIM is present.

11.4.8.3

Test description

11.4.8.3.1

Pre-test conditions

System Simulator:

- 2 NR Cells
  - NR Cell 1 and NR Cell 12 as defined in TS 38.508-1 [4], Table 4.4.2-3. System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates *ims-EmergencySupport*.
- No more than 2 cells active simultaneously at any time throughout the test.

UE:

- The UE is equipped with a test USIM with USIM Configuration 20 as defined in TS 38.508-1 [4], Table 6.4.1-20 (USIM contains two Emergency Numbers: 144, 117).

Preamble:

- Cells signal level in accordance with TS 38.508-1 [4], Table 6.2.2.1-3:
  - NR Cell 1 "Serving cell"
  - NR Cell 12 "Non-Suitable "Off" cell"
- The UE is in state SWITCHED\_OFF as defined in TS 38.508-1 [4], subclause 4.5.5.
- During the initial registration on NR Cell 1:
  - Local emergency number(s) and Extended local emergency number(s) are provided by the Network as specified in Table 11.4.8.3.3-1.

11.4.8.3.2

Test procedure sequence

Table 11.4.8.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

-	The following messages are to be observed on NR Cell 1 unless explicitly stated otherwise.	-	-	-	-
1	Power on the UE.	-	-	-	-
2	The Generic test procedure for NR RRC_IDLE described in TS 38.508-1 [4], Table 4.5.2.2-2 is performed. The UE performs registration and the RRC connection is released.  During the procedure the SS does not send new Local emergency number list and Extended local emergency number list in the REGISTRATION ACCEPT message.	-	-	-	-
3	Make the UE attempt an IMS call dialling number 120. (NOTE 1) The number was initially stored in the Local emergency number list being received in the REGISTRATION ACCEPT message in the Preamble but is expected to have been removed from the list upon switch-off.	-	-	-	-
4	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	1	-
5	Make the UE release the call. (NOTE 1)	-	-	-	-
6	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
7	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
8	Make the UE attempt an IMS call dialling number 10. (NOTE 1) The number was initially stored in the Extended local emergency number list being received in the REGISTRATION ACCEPT message in the Preamble but is expected to have been removed from the list upon switch-off.	-	-	-	-
9	Check: Does the UE performs Generic Test Procedure for IMS MO speech call establishment as specified in TS 38.508-1 [4], subclause 4.9.15?	-	-	2	-
10	Make the UE release the call. (NOTE 1)	-	-	-	-
11	The Generic test procedure for IMS MO call release as specified in TS 38.508-1 [4], subclause 4.9.17 takes place.	-	-	-	-
12	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	The SS configures: - NR Cell 12 as "Serving cell" - NR Cell 1 as "Non-Suitable "Off" cell"	-	-	-	-
-	The following messages are to be observed on NR Cell 12 unless explicitly stated otherwise.	-	-	-	-
13	The UE performs the Registration procedure for mobility registration update as specified in TS 38.508-1 [4] subclause 4.9.5. During the procedure the UE receives new Local emergency number list with 10 entries and Extended local emergency number list with 20 entries in the REGISTRATION ACCEPT message.	-	-	-	-
-	EXCEPTION: Steps 14-18 are repeated 10 times. Each iteration shall be started with different number being dialled. The following	-	-	-	-

	Local emergency numbers received in the REGISTRATION ACCEPT message in step 13 shall be used: 120 ... 129				
14	Make the UE attempt an IMS call dialling one of the numbers specified in the EXCEPTION step above. (NOTE 1)	-	-	-	-
15	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	3	-
16	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
17	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
18	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
-	EXCEPTION: Steps 19-23 are repeated 20 times. Each iteration shall be started with different number being dialled. The following Extended local emergency numbers received in the REGISTRATION ACCEPT message in step 13 shall be used: 10 ... 37, 130, 4001.	-	-	-	-
19	Make the UE attempt an IMS call dialling one of the numbers specified in the EXCEPTION step above. (NOTE 1)	-	-	-	-
20	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11?	-	-	4	-
21	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
22	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
23	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.8.3.3 Specific message contents

Table 11.4.8.3.3-1: REGISTRATION ACCEPT (Preamble)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition

Emergency number list			
Emergency Number information	120  TS 24.008 [43], 10.5.3.13.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	
Extended emergency number list			
EENLV	'0'	Extended Local Emergency Numbers List is valid in the country of the PLMN from which this IE is received	
Emergency Number information	10  TS 24.301 [21], 9.9.3.37A.	Number is different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	

Table 11.4.8.3.3-2: REGISTRATION ACCEPT (step 13, Table 11.4.8.3.2-1; step 4, TS 38.508-1 [4], Table 4.9.5.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-7.			
Information Element	Value/remark	Comment	Condition



Emergency number list			
Emergency Number information	10 numbers: 120 ... 129  TS 24.008 [43], 10.5.3.13.	Numbers different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	
Extended emergency number list			
EENLV	'0'	Extended Local Emergency Numbers List is valid in the country of the PLMN from which this IE is received	
Emergency Number information	20 numbers: 10 ... 37, 130, 4001  TS 24.301 [21], 9.9.3.37A.	Numbers different to any emergency number stored permanently in the ME AND the numbers stored in the USIM, as indicated in TS 22.101 [42] clause 10.1.1 a)-c).	

11.4.9 5GMM-DEREGISTERED.LIMITED-SERVICE No suitable cells in tracking area / Emergency call establishment and release

11.4.9.1 Test Purpose (TP)

(1)

with { UE in 5GMM-DEREGISTERED.LIMITED-SERVICE state after receiving REGISTRATION REJECT message with 5GMM cause value #15 'No suitable cells in tracking area' }

ensure that {

when { UE is requested to make an Emergency call }

then { UE establishes an RRC connection with the RRC *establishmentCause* set to "emergency", and, attempts an Initial registration for emergency services by sending a REGISTRATION REQUEST message with IE Service type set to "emergency services", and, accepts and applies security with NULL security and integrity algorithms, and, after successful completion of the registration for emergency services establishes an emergency PDU session by sending an UL NAS TRANSPORT message with Request type set to "initial emergency request" and a PDU SESSION ESTABLISHMENT REQUEST }

}

(2)

```
with { UE in 5GMM-DEREGISTERED.LIMITED-SERVICE state after receiving REGISTRATION REJECT message
with 5GMM cause value #15 'No suitable cells in tracking area' and having established an Emergency
call }

ensure that {

    when { UE is requested to release the Emergency call }

        then { UE releases the Emergency call, and, the UE considers the current cell as belonging to
5GS forbidden tracking areas for roaming }

}
```

11.4.9.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331 [12], subclause 5.3.3.3, TS 23.501 [37], subclause 5.16.4.1, TS 23.122 [38], subclause 3.4.2, TS 24.501 [22], subclauses 5.5.1.2.5, 4.4.4.1, 5.1.3.2.1.3.3, 5.3.2, 5.4.2.3, 5.5.1.2.2, 6.4.1.2, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 5.5.1.2.5]

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

...

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

...

- #15 (No suitable cells in tracking area).
- The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2). The UE shall reset the registration attempt counter and shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE. The UE shall search for a suitable cell in another tracking area according to 3GPP TS 38.304 [28].
- The UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and shall remove the current TAI from the stored TAI list, if present.
- If the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status and tracking area updating attempt counter as specified in 3GPP TS 24.301 [15] for the case when the normal tracking area updating procedure is rejected with the EMM cause with the same value.

[TS 23.122, subclause 3.4.2]

The MS is not allowed to request 5GS services except emergency services when camped on a cell of a TA of which belongs to the list of "5GS forbidden tracking areas for regional provision of service".

[TS 36.331, subclause 5.3.3.3]

The UE shall set the contents of *RRCSetupRequest* message as follows:

...

- 1> set the *establishmentCause* in accordance with the information received from upper layers;

The UE shall submit the *RRCSetupRequest* message to lower layers for transmission.

[TS 23.501, subclause 5.16.4.1]

UEs that are in limited service state, as specified in TS 23.122 [17], or that camp normally on a cell but failed to register successfully to the network under conditions specified in TS 24.501 [47], initiate the Registration procedure by indicating that the registration is to receive Emergency Services, referred to as Emergency Registration, and a Follow-on request is included in the Registration Request to initiate PDU Session Establishment procedure with a Request Type indicating "Emergency Request". UEs that had registered for normal services and do not have emergency PDU Sessions established and that are subject to Mobility Restriction in the present area or RAT (e.g. because of restricted tracking area) shall initiate the UE Requested PDU Session Establishment procedure to receive Emergency Services, i.e. with a Request Type indicating "Emergency Request". Based on local regulation, the network supporting Emergency Services for UEs in limited service state provides Emergency Services to these UE, regardless whether the UE can be authenticated, has roaming or Mobility Restrictions or a valid subscription.

[TS 24.501, subclause 4.4.4.1]

The use of "null integrity protection algorithm" 5G-IA0 (see subclause 9.11.3.32) in the current 5G NAS security context is only allowed for an unauthenticated UE for which establishment of emergency services is allowed. For setting the security header type in outbound NAS messages, the UE and the AMF shall apply the same rules irrespective of whether the "null integrity protection algorithm" or any other integrity protection algorithm is indicated in the 5G NAS security context.

If the "null integrity protection algorithm" 5G-IA0 has been selected as an integrity protection algorithm, the receiver shall regard the NAS messages with the security header indicating integrity protection as integrity protected.

[TS 24.501, subclause 5.1.3.2.1.3.3]

The substate 5GMM-DEREGISTERED.LIMITED-SERVICE is chosen in the UE, when it is known that a selected cell for 3GPP access or TA for non-3GPP access is unable to provide normal service (e.g. the selected cell over 3GPP access is in a forbidden PLMN or is in a forbidden tracking area or TA for non-3GPP access is forbidden).

[TS 24.501, subclause 5.3.2]

The UE provides the SUPI to the network in concealed form. The SUCI is a privacy preserving identifier containing the concealed SUPI. When the SUPI contains a network specific identifier, the SUCI shall take the form of an NAI as specified in 3GPP TS 23.003 [4].

A UE supporting N1 mode includes a SUCI:

- a) in the REGISTRATION REQUEST message when the UE is attempting initial registration procedure and a valid 5G-GUTI is not available; or

...

The UE shall use the "null-scheme" as specified in 3GPP TS 33.501 [24] to generate the SUCI, if the following applies:

- a) the UE performs a registration procedure for emergency services or initiates a de-registration procedure before the registration procedure for emergency services was completed successfully; and

[TS 24.501, subclause 5.4.2.3]

If the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session and the SECURITY MODE COMMAND message is received with ngKSI value "000" and 5G-IA0 and 5G-EA0 as selected 5G NAS security algorithms, the UE shall locally derive and take in use 5G NAS security context. The UE shall delete existing current 5G NAS security context.

The UE shall accept a SECURITY MODE COMMAND message indicating the "null integrity protection algorithm" 5G-EA0 as the selected 5G NAS integrity algorithm only if the message is received when the UE is registered for emergency services, performing initial registration for emergency services or establishing an emergency PDU session.

[TS 24.501, subclause 5.5.1.2.2]

The UE in state 5GMM-DEREGISTERED shall initiate the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF,

...

b) when the UE performs initial registration for emergency services;

...

If the UE initiates an initial registration for emergency services or needs to prolong the established NAS signalling connection after the completion of the initial registration procedure (e.g. due to uplink signalling pending), the UE shall set the Follow-on request indicator to 1.

[TS 24.501, subclause 6.4.1.2]

In order to initiate the UE-requested PDU session establishment procedure, the UE shall create a PDU SESSION ESTABLISHMENT REQUEST message.

NOTE 0: When IMS voice is available over either 3GPP access or non-3GPP access, the "voice centric" UE in 5GMM-REGISTERED state will receive a request from upper layers to establish the PDU session for IMS signalling, if the conditions for performing an initial registration with IMS indicated in 3GPP TS 24.229 [14] subclause U.3.1.2 are satisfied.

If the UE requests to establish a new PDU session, the UE shall allocate a PDU session ID which is not currently being used by another PDU session over either 3GPP access or non-3GPP access.

The UE shall allocate a PTI value currently not used and shall set the PTI IE of the PDU SESSION ESTABLISHMENT REQUEST message to the allocated PTI value.

...

If the UE requests to establish a new emergency PDU session, the UE shall set the SSC mode IE of the PDU SESSION ESTABLISHMENT REQUEST message to "SSC mode 1".

...

The UE shall transport:

- a) the PDU SESSION ESTABLISHMENT REQUEST message;
- b) the PDU session ID of the PDU session being established, or being handed over or being transferred;

..

e) the request type which is set to:

...

3) "initial emergency request", if the UE requests to establish a new emergency PDU session; and

...

If the request type is set to "initial emergency request" or "existing emergency PDU session", neither DNN nor S-NSSAI is transported by the UE using the NAS transport procedure as specified in subclause 5.4.5.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.

11.4.9.3

Test description

11.4.9.3.1

Pre-test conditions

System Simulator:

- 1 NR Cell
- NR Cell 1, as defined in TS 38.508-1 [4], Table 4.4.2-3.
- System information combination NR-1 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2. SIB1 indicates *ims-EmergencySupport*.

UE:

None.

Preamble:

- The UE is in test state 0N-B (Switched Off) as defined in TS 38.508-1 [4], subclause 4.4A.2.

11.4.9.3.2

Test procedure sequence

Table 11.4.9.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Switch the UE on.	-	-	-	-
2-4	Steps 2-4 of Table 4.5.2.2-2 NR RRC_IDLE in TS38.508-1 [4] take place (the UE initiates an initial registration procedure).	-	-	-	-
5	SS sends a REGISTRATION REJECT message containing 5GMM cause value = #15 (No suitable cells in tracking area).	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: REGISTRATION REJECT	-	-
6	The SS transmits an <i>RRCConnectionRelease</i> message.	<--	NR RRC: <i>RRCRelease</i>	-	-
7	Make the UE attempt an IMS emergency call dialling a number which is stored on the ME (e.g. 112 or 911). (NOTE 1)	-	-	-	-
8	Check: Does the UE performs Generic Test Procedure for IMS Emergency call establishment without IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.12?	-	-	1	-
9	Make the UE release the emergency call. (NOTE 1)	-	-	-	-
10	The Generic test procedure for IMS MO Emergency call release as specified in TS 38.508-1 [4], subclause 4.9.12A takes place.	-	-	-	-
11	Start Timer=10 sec. NOTE: This is an arbitrary value to wait for UE initiated detach.	-	-	-	-
-	EXCEPTION: Steps 12a1-12b3 describes optional behaviour that depends on the UE implementation.	-	-	-	-
12a 1	The UE transmits a DEREGISTRATION REQUEST message with De-registration type IE set to "Normal de-registration".	-->	NR RRC: <i>ULInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
12a 2	The SS transmits a DEREGISTRATION ACCEPT message.	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: DEREGISTRATION ACCEPT	-	-
12a 3	Stop Timer=10.	-	-	-	-
12b 1	Timer=10 sec expires	-	-	-	-
12b 2	The SS transmits a DEREGISTRATION REQUEST message with Deregistration type IE set to "re-registration not required".	<--	NR RRC: <i>DLInformationTransfer</i> 5GMM: DEREGISTRATION REQUEST	-	-
12b 3	The UE transmits a DEREGISTRATION ACCEPT message.	-->	NR RRC: <i>ULInformationTransfer</i> 5GMM: DEREGISTRATION ACCEPT	-	-
13	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
14	Check: Does the UE transmit an <i>RRCSetupRequest</i> message in the next 30sec? NOTE: This is an arbitrary value to wait for catching not allowed UE behaviour.	-->	NR RRC: <i>RRCSetupRequest</i>	2	F
NOTE 1: This could be done by e.g. MMI or AT command.					

11.4.9.3.3 Specific message contents

Table 11.4.9.3.3-1: REGISTRATION REJECT (step 5, Table 11.4.9.3.2-1)

Derivation path: TS 38.508-1 [4] table 4.7.1-9.			
Information Element	Value/remark	Comment	Condition

5GMM cause	'00001111'B	#15 (No suitable cells in tracking area).	
------------	-------------	---	--

Table 11.4.9.3.3-2: REGISTRATION REQUEST (step 8, Table 11.4.9.3.2-1; step 3, TS 38.508-1 [4], Table 4.9.12.2.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-6, condition EMERGENCY.			
Information Element	Value/remark	Comment	Condition
5GS mobile identity	SUCI	The UE shall use the "null-scheme" as specified in 3GPP TS 33.501 [20] to generate the SUCI	

Table 11.4.9.3.3-3: DEREGISTRATION REQUEST (Step 12a1, Table 11.4.9.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-12, Condition NORMAL.
---

Table 11.4.9.3.3-4: DEREGISTRATION REQUEST (Step 12b2, Table 11.4.9.3.2-1)

Derivation Path: TS 38.508-1 [4], Table 4.7.1-14.			
Information Element	Value/remark	Comment	Condition
De-registration type			
bit 3	'0'B	re-registration not required	
Access type	'01'B	3GPP access	
5GMM cause	'00001111'B	#15 (No suitable cells in tracking area).	

11.4.10 5GMM-REGISTERED.NORMAL-SERVICE / N26 interface not supported / N1 mode to S1 mode transfer of an existing emergency PDU session

11.4.10.1 Test Purpose (TP)

(1)

with { UE in 5GMM-REGISTERED.NORMAL-SERVICE state and 5GMM-IDLE mode with Interworking without N26 interface supported, and, the UE has an emergency PDU session established }

ensure that {

  when { UE performs a inter-system change from the N1 to S1 mode }

    then { UE correctly transfers the existing emergency PDU session into an emergency PDN connection }

}

**11.4.10.2 Conformance requirements**

References: The conformance requirements covered in the present TC are specified in: TS 24.501 [22], subclause 6.1.4.2, TS 22.101 [42], subclause 10.1.1. Unless otherwise stated these are Rel-15 requirements.

[TS 24.501, subclause 6.1.4.2]

Upon inter-system change from N1 mode to S1 mode in EMM-IDLE mode, the UE shall use the parameters from each PDU session which the UE intends to transfer to EPS to create the contents of a PDN CONNECTIVITY REQUEST message as follows:

- a) if the PDU session is an emergency PDU session, the request type shall be set to "handover of emergency bearer services". Otherwise the request type shall be set to "handover";
- b) the PDU session type of the PDU session shall be mapped to the PDN type of the default EPS bearer context as follows:
  - 1) the PDN type shall be set to "non-IP" if the PDU session type is "Ethernet" or "Unstructured";
  - 2) the PDN type shall be set to "IPv4" if the PDU session type is "IPv4";
  - 3) the PDN type shall be set to "IPv6" if the PDU session type is "IPv6"; and
  - 4) the PDN type shall be set to "IPv4v6" if the PDU session type is "IPv4v6";
- c) the DNN of the PDU session shall be mapped to the APN of the default EPS bearer context; and
- d) the PDU session ID parameter in the PCO IE shall be set to the PDU session identity of the PDU session.

After inter-system change from N1 mode to S1 mode, the UE shall associate the PDU session identity with the default EPS bearer context.

[TS 22.101, subclause 10.1.1]

The ME shall identify an emergency number dialled by the end user as a valid emergency number and initiate emergency call establishment if it occurs under one or more of the following conditions. If it occurs outside of the following conditions, the ME should not initiate emergency call establishment but normal call establishment. Emergency number identification takes place before and takes precedence over any other (e.g. supplementary service related) number analysis.

- a) 112 and 911 shall always be available. These numbers shall be stored on the ME.

**11.4.10.3 Test description**

**11.4.10.3.1 Pre-test conditions**

**System Simulator:**

- 2 cells
- NR Cell 1 as defined in TS 38.508-1 [4] Table 4.4.2-3. System information combination NR-6 as defined in TS 38.508-1 [4], subclause 4.4.3.1.2.
- E-UTRA Cell 1 as defined in TS 36.508 [7] Table 4.4.2-2. System information combination 31 as defined in TS 36.508 [7], subclause 4.4.3.1.1.

**UE:**

None.



Preamble:

With E-UTRA Cell 1 "Non-suitable "Off" cell" and NR Cell 1 "Serving cell" in accordance with TS 38.508-1 [4], Table 6.2.2.1-3, the UE is brought to state 1N-A, RRC\_IDLE Connectivity (NR), in accordance with the procedure described in TS 38.508-1 [4], subclause 4.5.2 (Table 4.5.2.2-2 and depending on UE implementation Table 4.5.2.2-4). Interworking without N26 interface supported in accordance with the definition specified in TS 38.508-1 [4], subclause 4.5.1.

11.4.10.3.2 Test procedure sequence

Table 11.4.10.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE attempt an IMS emergency call dialling an emergency number. (NOTE 1)	-	-	-	-
2	The UE performs Generic Test Procedure for IMS Emergency call establishment with IMS emergency registration as specified in TS 38.508-1 [4], subclause 4.9.11.	-	-	-	-
3	SS releases the RRC connection	<--	NR RRC: <i>RRCRelease</i>	-	-
4	The SS configures: - E-UTRA Cell A as "Serving cell" - NGC Cell A as "Non-suitable "off" cell".	-	-	-	-
5-10	Steps 1-6 from the test procedure for UE for Tracking area updating / Inter-system change from N1 mode to S1 mode in 5GMM/EMM-IDLE mode as specified in TS 38.508-1 [4], Table 4.9.7.2.2-1, take place.	-	-	-	-
-	EXCEPTION: In parallel to step 10Aa1 below the steps described in table 11.4.10.3.2-2 take place.	-	-	-	-
10Aa1	Step 6Aa1 from the test procedure for UE for Tracking area updating / Inter-system change from N1 mode to S1 mode in 5GMM/EMM-IDLE mode as specified in TS 38.508-1 [4], Table 4.9.7.2.2-1, takes place.	-	-	-	-
10Ab2a1 - 10Ab2a8	Steps 6Ab2a1 - 6Ab2a8 from the test procedure for UE for Tracking area updating / Inter-system change from N1 mode to S1 mode in 5GMM/EMM-IDLE mode as specified in TS 38.508-1 [4], Table 4.9.7.2.2-1, take place.	-	-	-	-
NOTE 1: This could be done by e.g. MMI or AT command.					

Table 11.4.10.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Check: Does the UE transmit a PDN CONNECTIVITY REQUEST message to request an additional PDN, with 'Request type' set to 'handover of emergency bearer services'?	-->	PDN CONNECTIVITY REQUEST	1	P
2-7	Steps 10-15 from the Generic Test Procedure for IMS Emergency call establishment in EUTRA: Normal Service as specified in TS 36.508 [7], Table 4.5A.4.3-1 are performed.	-	-	-	-

11.4.10.3.3 Specific message contents

Table 11.4.10.3.3-1: REGISTRATION ACCEPT (Preamble)

Derivation path: TS 38.508-1 [4], Table 4.7.1-7, condition EMERGENCY			
Information Element	Value/remark	Comment	Condition
5GS network feature support	'0100 1101 0000 0000'B	IMS voice over PS session supported over 3GPP access, Emergency services supported in NR connected to 5GCN and E-UTRA connected to 5GCN. <b>Interworking without N26 interface supported (octet 3, bit 7)</b> All other features set to "not supported".	Interworking without N26 interface supported

Table 11.4.10.3.3-2: PDN CONNECTIVITY REQUEST (step 1, Table 11.4.10.3.2-2)

Derivation Path: TS 36.508 [7], Table 4.7.2-1.			
Information Element	Value/remark	Comment	Condition

Request type	'001'B	'handover of emergency bearer services'	
PDN type	The PDU session type of the emergency PDU session established prior to the N1 to S1 move	The PDU session established in step 2, Table 11.4.10.3.2-1	
Access point name	sos		
Protocol configuration options	Only the values indicated below are checked		
protocol identifier			
length of the protocol identifier contents of the unit			
protocol identifier contents			
Additional parameters list			
container identifier	001AH	(PDU session ID)	
container identifier contents	The PDU session ID of the emergency PDU session established prior to the N1 to S1 move.		

12NR sidelink

12.1PC5-only operation

12.2Inter-carrier concurrent operation

12.2.1Inter-carrier concurrent operation / Sidelink communication

12.2.1.1

12.2.1.2

12.2.1.3Inter-carrier concurrent operation / Sidelink communication / RRC\_CONNECTED / Transmission / Network scheduling

12.2.1.3.1Test Purpose (TP)

(1)

```
with { UE is in RRC_CONNECTED state and its serving cell broadcasts SIB12 including sl-ConfigCommonNR }

ensure that {

  when { UE is configured by upper layers to perform sidelink transmission on the frequency included in sl-FreqInfoList }

  then { UE sends a SidelinkUEInfomationNR message to indicate it requires sidelink transmission resources }

}
```

**(2)**

**with** { UE is in RRC\_CONNECTED state and is configured by upper layers to perform sidelink transmission }

**ensure that** {

**when** { UE receives an RRCReconfiguration message which includes sl-ScheduledConfig and no sl-ConfiguredGrantConfigList }

**then** { UE performs sidelink transmission based on dynamic scheduling }

    }

**(3)**

**with** { UE is in RRC\_CONNECTED state }

**ensure that** {

**when** { UE is configured by upper layers to provide configured grant assistance information for NR sidelink communication }

**then** { UE sends a UEAssistanceInformation message including sl-UE-AssistanceInformationNR }

    }

**(4)**

**with** { UE is in RRC\_CONNECTED state and is configured by upper layers to perform sidelink transmission }

**ensure that** {

**when** { UE receives an RRCReconfiguration message which includes sl-ConfiguredGrantConfigList }

**then** { UE performs sidelink transmission using the configured grant included in sl-ConfiguredGrantConfigList }

    }

**(5)**

**with** { UE is in RRC\_CONNECTED state and is configured by upper layer to perform sidelink transmission }

**ensure that** {

**when** { UE is no longer configured by upper layers to perform sidelink transmission }

**then** { UE sends a SidelinkUEInformationNR message to indicate it no longer requires sidelink transmission resources }

    }

12.2.1.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 38.331, clause 5.3.5.3, 5.5.2, 5.5.4.1, 5.5.4.2, 5.5.4.3 and 5.5.5. Unless otherwise stated these are Rel-16 requirements.

[TS 38.331, clause 5.3.5.3]

The UE shall perform the following actions upon reception of the *RRCReconfiguration*, or upon execution of the conditional reconfiguration (CHO or CPC):

...

- 1> if the *RRCReconfiguration* message includes the *otherConfig*:
  - 2> perform the other configuration procedure as specified in 5.3.5.9;

...

- 1> if the *RRCReconfiguration* message includes the *sl-ConfigDedicatedNR*:
  - 2> perform the sidelink dedicated configuration procedure as specified in 5.3.5.14;

...

- 1> else (*RRCReconfiguration* was received via SRB1):
  - 2> submit the *RRCReconfigurationComplete* message via SRB1 to lower layers for transmission using the new configuration;

...

[TS 38.331, clause 5.3.5.14]

Upon initiating the procedure, the UE shall:

...

- 1> if *sl-FreqInfoToAddModList* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

...

- 2> if configured to transmit NR sidelink communication:
  - 3> use the resource pool(s) indicated by *sl-TxPoolSelectedNormal*, *sl-TxPoolScheduling* or *sl-TxPoolExceptional* for NR sidelink communication transmission, as specified in 5.8.8;
- 2> perform CBR measurement on the transmission resource pools indicated by *sl-TxPoolSelectedNormal*, *sl-TxPoolScheduling* or *sl-TxPoolExceptional* for NR sidelink communication transmission, as specified in 5.5.3;
- 2> use the synchronization configuration parameters for NR sidelink communication on frequencies included in *sl-FreqInfoToAddModList*, as specified in 5.8.5;

...

- 1> if *sl-RadioBearerToAddModList* or *sl-RLC-BearerToAddModList* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*:
  - 2> perform sidelink DRB addition/modification as specified in 5.8.9.1a.2;

- 1> if *sl-ScheduledConfig* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

2> configure the MAC entity parameters, which are to be used for NR sidelink communication, in accordance with the received *sl-ScheduledConfig*;

...

[TS 38.331, clause 5.7.4.2]

...

A UE capable of providing configured grant assistance information for NR sidelink communication in RRC\_CONNECTED may initiate the procedure in several cases, including upon being configured to provide traffic pattern information and upon change of traffic patterns.

...

Upon initiating the procedure, the UE shall:

...

- 1> if configured to provide configured grant assistance information for NR sidelink communication:
- 2> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide configured grant assistance information for NR sidelink communication;

...

[TS 38.331, clause 5.7.4.3]

...

The UE shall set the contents of the *UEAssistanceInformation* message for configured grant assistance information for NR sidelink communication:

- 1> if configured to provide configured grant assistance information for NR sidelink communication:
- 2> include the *sl-UE-AssistanceInformationNR*;
- ...
- 1> else:
- 2> submit the *UEAssistanceInformation* message to lower layers for transmission.

[TS 38.331, clause 5.8.3.2]

Upon initiating this procedure, the UE shall:

- 1> if *SIB12* including *sl-ConfigCommonNR* is provided by the PCell:
- 2> ensure having a valid version of *SIB12* for the PCell;
- ...
- 2> if configured by upper layers to transmit NR sidelink communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell:
- 3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or
- 3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqList*; or if the information carried by the *sl-TxResourceReqList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink communication transmission resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink communication transmission resources in accordance with 5.8.3.3.

[TS 38.331, clause 5.8.3.3]

The UE shall set the contents of the *SidelinkUEInformationNR* message as follows:

1> if the UE initiates the procedure to indicate it is (no more) interested to receive NR sidelink communication or to request (configuration/ release) of NR sidelink communication transmission resources or to report to the network that a sidelink radio link failure or sidelink RRC reconfiguration failure has been declared (i.e. UE includes all concerned information, irrespective of what triggered the procedure):

2> if *SIB12* including *sl-ConfigCommonNR* is provided by the PCell:

...

3> if configured by upper layers to transmit NR sidelink communication:

4> include *sl-TxResourceReqList* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink communication resource:

5> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink communication transmission;

5> set *sl-CastType* to the cast type of the associated destination identity configured by the upper layer for the NR sidelink communication transmission;

...

5> set *sl-QoS-InfoList* to include QoS profile(s) of the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink communication transmission;

5> set *sl-InterestedFreqList* to indicate the frequency of the associated destination for NR sidelink communication transmission;

5> set *sl-TypeTxSyncList* to the current synchronization reference type used on the associated *sl-InterestedFreqList* for NR sidelink communication transmission.

...

...

1> else:

2> submit the *SidelinkUEInformationNR* message to lower layers for transmission;

[TS 38.331, clause 5.8.8]

A UE capable of NR sidelink communication that is configured by upper layers to transmit NR sidelink communication and has related data to be transmitted shall:

- 1> if the conditions for NR sidelink communication operation as defined in 5.8.2 are met:
- 2> if the frequency used for NR sidelink communication is included in *sl-FreqInfoToAddModList* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or included in *sl-ConfigCommonNR* within *SIB12*:
- 3> if the UE is in RRC\_CONNECTED and uses the frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message:
- 4> if the UE is configured with *sl-ScheduledConfig*:
  - ...
- 5> else:
  - 6> configure lower layers to perform the sidelink resource allocation mode 1 for NR sidelink communication;
  - ...

[TS 38.321, clause 5.22.1.1]

...

If the MAC entity has been configured with Sidelink resource allocation mode 1 as indicated in TS 38.331 [5], the MAC entity shall for each PDCCH occasion and for each grant received for this PDCCH occasion:

- 1> if a sidelink grant has been received on the PDCCH for the MAC entity's SL-RNTI:
  - ...
- 2> else:
  - 3> use the received sidelink grant to determine PSCCH duration(s) and PSSCH duration(s) for initial transmission and, if available, retransmission(s) of a single MAC PDU according to clause 8.1.2 of TS 38.214 [7].
  - ...
- 1> else if a sidelink grant has been received on the PDCCH for the MAC entity's SLCS-RNTI:
  - 2> if PDCCH contents indicate retransmission(s) for the identified HARQ process ID that has been set for an activated configured sidelink grant identified by *sl-ConfigIndexCG*:
  - 3> use the received sidelink grant to determine PSCCH duration(s) and PSSCH duration(s) for one or more retransmissions of a single MAC PDU according to clause 8.1.2 of TS 38.214 [7].
  - ...

The MAC entity shall for each PSSCH duration:

- 1> for each sidelink grant occurring in this PSSCH duration:
- 2> if the MAC entity has been configured with Sidelink resource allocation mode 1:
  - 3> select a MCS which is, if configured, within the range that is configured by RRC between *sl-MinMCS-PSSCH* and *sl-MaxMCS-PSSCH* included in *sl-ConfigDedicatedNR*;
  - 3> set the resource reservation interval to 0ms.
  - ...



- 2> if the configured sidelink grant has been activated and this PSSCH duration corresponds to the first PSSCH transmission opportunity within this *sl-PeriodCG* of the configured sidelink grant:
- 3> set the HARQ Process ID to the HARQ Process ID associated with this PSSCH duration and, if available, all subsequent PSSCH duration(s) occurring in this *sl-PeriodCG* for the configured sidelink grant;
- 3> determine that this PSSCH duration is used for initial transmission;
- 3> if a dynamic sidelink grant associated to the HARQ Process ID has been received on the PDCCH for the MAC entity's SLCS-RNTI:
  - 4> clear the dynamic sidelink grant.
- 2> deliver the sidelink grant, the selected MCS, and the associated HARQ information to the Sidelink HARQ Entity for this PSSCH duration.

...

[TS 38.321, clause 5.22.1.1]

...

A SL-BSR shall be triggered if any of the following events occur:

- 1> if the MAC entity has been configured with Sidelink resource allocation mode 1:
  - 2> SL data, for a logical channel of a Destination, becomes available to the MAC entity; and either
    - 3> this SL data belongs to a logical channel with higher priority than the priorities of the logical channels containing available SL data which belong to any LCG belonging to the same Destination; or
    - 3> none of the logical channels which belong to an LCG belonging to the same Destination contains any available SL data.

in which case the SL-BSR is referred below to as 'Regular SL-BSR';

...

1> else:

- 2> Sidelink resource allocation mode 1 is configured by RRC and SL data is available for transmission in the RLC entity or in the PDCP entity, in which case the Sidelink BSR is referred below to as "Regular SL-BSR".

For Regular SL-BSR, the MAC entity shall:

- 1> if the SL-BSR is triggered for a logical channel for which *sl-logicalChannelSR-DelayTimerApplied* with value *true* is configured by RRC:
  - 2> start or restart the *sl-logicalChannelSR-DelayTimer*.
- 1> else:
  - 2> if running, stop the *sl-logicalChannelSR-DelayTimer*.

For Regular and Periodic SL-BSR, the MAC entity shall:

- 1> if *sl-PrioritizationThres* is configured and the value of the highest priority of the logical channels that belong to any LCG and contain SL data for any Destination is lower than *sl-PrioritizationThres*; and
- 1> if either *ul-PrioritizationThres* is not configured or *ul-PrioritizationThres* is configured and the value of the highest priority of the logical channels that belong to any LCG and contain UL data is equal to or higher than *ul-PrioritizationThres* according to clause 5.4.5:

- 2> prioritize the LCG(s) for the Destination(s).
- 1> if the Buffer Status reporting procedure determines that at least one BSR has been triggered and not cancelled according to clause 5.4.5 and the UL grant cannot accommodate a SL-BSR MAC CE containing buffer status only for all prioritized LCGs having data available for transmission plus the subheader of the SL-BSR according to clause 5.4.3.1.3, in case the SL-BSR is considered as not prioritized:

2> prioritize the SL-BSR for logical channel prioritization specified in clause 5.4.3.1;

2> report Truncated SL-BSR containing buffer status for as many prioritized LCGs having data available for transmission as possible, taking the number of bits in the UL grant into consideration.

1> else if the number of bits in the UL grant is expected to be equal to or larger than the size of a SL-BSR containing buffer status for all LCGs having data available for transmission plus the subheader of the SL-BSR according to clause 5.4.3.1.3:

2> report SL-BSR containing buffer status for all LCGs having data available for transmission.

1> else:

2> report Truncated SL-BSR containing buffer status for as many LCGs having data available for transmission as possible, taking the number of bits in the UL grant into consideration.

...
- The MAC entity shall:
- 1> if the sidelink Buffer Status reporting procedure determines that at least one SL-BSR has been triggered and not cancelled:

2> if UL-SCH resources are available for a new transmission and the UL-SCH resources can accommodate the SL-BSR MAC CE plus its subheader as a result of logical channel prioritization according to clause 5.4.3.1:

3> instruct the Multiplexing and Assembly procedure in clause 5.4.3 to generate the SL-BSR MAC CE(s);

3> start or restart *sl-periodicBSR-Timer* except when all the generated SL-BSRs are Truncated SL-BSRs;

3> start or restart *sl-retxBSR-Timer*.

...
- 12.2.1.3.3

Test description
- 12.2.1.3.3.1

Pre-test conditions
- System Simulator:
- SS-NW

- NR Cell 1

- System information combination FFS as defined in TS 38.508-1[4] clause 4.4.3.1 is used in NR Cell 1.

- SS-UE

- Operating as NR sidelink communication receiving device on the resources that UE is expected to use for transmission.
- 3GPP

UE:

- UE is authorised to perform NR sidelink communication.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [4], subclause 4.4A on NR Cell 1 and Test Loop Function (*On*) with UE test loop mode FFS defined in 38.509 [6], subclause FFS.

12.2.1.3.3.2            Test procedure sequence

FFS

Table 12.2.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		

1	Upper layers of the UE configures the UE to perform sidelink transmission. Note: This step is triggered by MMI or AT command	-	-	-	-
2	Check: Does the UE send a SidelinkUEInformationNR message to request sidelink transmission resource?	-->	NR RRC: <i>SidelinkUEInformationNR</i>	1	P
3	SS-NW transmits an RRCReconfiguration message with sl-ConfigDedicatedNR to configure transmission resources and to configure the UE to perform network scheduling-based sidelink transmission	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
4	The UE transmits an RRCReconfigurationComplete message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>		
5	Check: Does the UE send a Sidelink BSR MAC-CE?	-->	MAC CE (sidelink BSR)	2	P
5	SS-NW sends a DCI format 3_0 to configure sidelink grant for the UE	<--	DCI format 3_0	-	-
6	Check: Does the UE transmit one STCH PDCP SDU over the PC5 interface using the resources scheduled by SS-NW?	-->	STCH PDCP SDU	2	P
7	Upper layers of the UE configures the UE to send a UEAssistanceInformation message. Note: This step is triggered by MMI or AT command	-	-	-	-
8	Check: Does the UE send a UEAssistanceInformation message to provide configured grant assistance information?	-->	NR RRC: <i>UEAssistanceInformation</i>	3	P
9	SS-NW transmits an RRCReconfiguration message with sl-ConfiguredGrantConfigList to provide a Type 2 configure grant for the UE.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
10	The UE transmits an RRCReconfigurationComplete message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>	-	-
11	SS-NW transmits an DCI format 3_0 to activate the configured grant.	<--	DCI format 3_0	-	-
12	The UE sends a Sidelink Configured Grant Confirmation MAC CE	-->	MAC CE (Sidelink Configured Grant Confirmation)	-	-
13	Check: Does the UE transmit one STCH PDCP SDU over the PC5 interface using the resources indicated by the configured grant?	-->	STCH PDCP SDU	4	P
14	Upper layer of the UE configures the UE to stop sidelink transmission.	-	-	-	-
15	Check: Does the UE send a SidelinkUEInformationNR message to indicate that sidelink transmission resource is not needed?	-->	NR RRC: <i>SidelinkUEInformationNR</i>	1	P

12.2.1.3.3.3 Specific message contents

FFS

12.2.2

12.2.3 Inter-carrier concurrent operation / Measurement configuration and reporting via Uu RRC

12.2.3.1 Inter-carrier concurrent operation / Measurement configuration and reporting via Uu RRC / CBR measurement reporting / Event C1 and C2

12.2.3.1.1 Test Purpose (TP)

(1)

`with { UE is in NR RRC_CONNECTED state and is configured to perform event C1 triggered CBR measurement reporting on resource pool }`

`ensure that {`

`when { CBR measurement result of indicated resource pool satisfies entering condition for event C1 }`

`then { UE sends MeasurementReport message to report CBR measurement results of indicated resource pool }`

`}`

(2)

`with { UE is in NR RRC_CONNECTED state and the periodical measurement reporting triggered by event C1 is ongoing }`

`ensure that {`

`when { CBR measurement result of indicated resource pool satisfies leaving condition for event C1 }`

`then { UE stops sending MeasurementReport message }`

`}`

(3)

`with { UE is in NR RRC_CONNECTED state and is configured to perform event C2 triggered CBR measurement reporting on resource pool }`

`ensure that {`

`when { CBR measurement result of indicated resource pool satisfies entering condition for event C1 }`

`then { UE sends MeasurementReport message to report CBR measurement results of indicated resource pool }`

`}`

(4)

```
with { UE is in NR RRC_CONNECTED state and the periodical measurement reporting triggered by event
C2 is ongoing }

ensure that {

    when { CBR measurement result of indicated resource pool satisfies leaving condition for event
C2 }

    then { UE stops sending MeasurementReport message }

}
```

12.2.3.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 38.331, clause 5.3.5.3, 5.5.2, 5.5.4.1, 5.5.4.2, 5.5.4.3 and 5.5.5. Unless otherwise stated these are Rel-16 requirements.

[TS 38.331, clause 5.3.5.3]

The UE shall perform the following actions upon reception of the *RRCReconfiguration*, or upon execution of the conditional reconfiguration (CHO or CPC):

```
...

1> if the RRCReconfiguration message includes the measConfig:

    2> perform the measurement configuration procedure as specified in 5.5.2;

...

1> else (RRCReconfiguration was received via SRB1):

    2> submit the RRCReconfigurationComplete message via SRB1 to lower layers for transmission using the new
configuration;

...

```

[TS 38.331, clause 5.5.2.1]

...

The UE shall:

```
...

1> if the received measConfig includes the measObjectToAddModList:

    2> perform the measurement object addition/modification procedure as specified in 5.5.2.5;

...

1> if the received measConfig includes the reportConfigToAddModList:

    2> perform the reporting configuration addition/modification procedure as specified in 5.5.2.7;

1> if the received measConfig includes the quantityConfig:

    2> perform the quantity configuration procedure as specified in 5.5.2.8;

...

```

- 1> if the received *measConfig* includes the *measIdToAddModList*:
- 2> perform the measurement identity addition/modification procedure as specified in 5.5.2.3;

...

[TS 38.331, clause 5.5.3.1]

The UE shall:

- 1> whenever the UE has a *measConfig*, perform RSRP and RSRQ measurements for each serving cell for which *servingCellMO* is configured as follows:
- 2> if the *reportConfig* associated with at least one *measId* included in the *measIdList* within *VarMeasConfig* contains an *rsType* set to *ssb* and *ssb-ConfigMobility* is configured in the *measObject* indicated by the *servingCellMO*:
- 3> if the *reportConfig* associated with at least one *measId* included in the *measIdList* within *VarMeasConfig* contains a *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport* and contains an *rsType* set to *ssb*:
  - 4> derive layer 3 filtered RSRP and RSRQ per beam for the serving cell based on SS/PBCH block, as described in 5.5.3.3a;
- 3> derive serving cell measurement results based on SS/PBCH block, as described in 5.5.3.3;

...

The UE capable of CBR measurement when configured to transmit NR sidelink communication shall:

- 1> If the frequency used for NR sidelink communication is included in *sl-FreqInfoToAddModList* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or included in *sl-ConfigCommonNR* within *SIB12*:

...

- 2> if the UE is in RRC\_CONNECTED:
  - 3> if *tx-PoolMeasToAddModList* is included in *VarMeasConfig*:
    - 4> perform CBR measurements on each transmission resource pool indicated in the *tx-PoolMeasToAddModList*;
  - 3> if *sl-TxPoolSelectedNormal*, *sl-TxPoolScheduling* or *sl-TxPoolExceptional* is included in *sl-ConfigDedicatedNR* for the concerned frequency within RRCReconfiguration:
    - 4> perform CBR measurement on pools in *sl-TxPoolSelectedNormal*, *sl-TxPoolScheduling* or *sl-TxPoolExceptional* if included in *sl-ConfigDedicatedNR* for the concerned frequency within RRCReconfiguration;
  - 3> else if the cell chosen for NR sidelink communication provides *SIB12* which includes *sl-TxPoolSelectedNormal* or *sl-TxPoolExceptional* for the concerned frequency:
    - 4> perform CBR measurement on pools in *sl-TxPoolSelectedNormal* and *sl-TxPoolExceptional* for the concerned frequency in *SIB12*;

- 1> else:

- 2> perform CBR measurement on pools in *sl-TxPoolSelectedNormal* and *sl-TxPoolExceptional* in *SidelinkPreconfigNR* for the concerned frequency.

...

[TS 38.331, clause 5.5.4.1]

If AS security has been activated successfully, the UE shall:

1> for each *measId* included in the *measIdList* within *VarMeasConfig*:

...

2> if the corresponding *reportConfig* concerns the reporting for NR sidelink communication (i.e. *reportConfigNR-SL*):

3> consider the transmission resource pools indicated by the *tx-PoolMeasToAddModList* defined within the *VarMeasConfig* for this *measId* to be applicable;

...

2> else if the *reportType* is set to *eventTriggered* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable transmission resource pools for all measurements taken during *timeToTrigger* defined for this event within the *VarMeasConfig*, while the *VarMeasReportList* does not include an measurement reporting entry for this *measId* (a first transmission resource pool triggers the event):

3> include a measurement reporting entry within the *VarMeasReportList* for this *measId*;

3> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;

3> include the concerned transmission resource pool(s) in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId*;

3> initiate the measurement reporting procedure, as specified in 5.5.5;

2> else if the *reportType* is set to *eventTriggered* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable transmission resource pools not included in the *poolsTriggeredList* for all measurements taken during *timeToTrigger* defined for this event within the *VarMeasConfig* (a subsequent transmission resource pool triggers the event):

3> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;

3> include the concerned transmission resource pool(s) in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId*;

3> initiate the measurement reporting procedure, as specified in 5.5.5;

2> else if the *reportType* is set to *eventTriggered* and if the leaving condition applicable for this event is fulfilled for one or more applicable transmission resource pools included in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId* for all measurements taken during *timeToTrigger* defined within the *VarMeasConfig* for this event:

3> remove the concerned transmission resource pool(s) in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId*;

3> if the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId* is empty:

4> remove the measurement reporting entry within the *VarMeasReportList* for this *measId*;

4> stop the periodical reporting timer for this *measId*, if running

...

2> upon expiry of the periodical reporting timer for this *measId*:



3> initiate the measurement reporting procedure, as specified in 5.5.5.

...

[TS 38.331, clause 5.5.4.11]

The UE shall:

1> consider the entering condition for this event to be satisfied when condition C1-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition C1-2, as specified below, is fulfilled;

Inequality C1-1 (Entering condition)

$$Ms - Hys > Thresh$$

Inequality C1-2 (Leaving condition)

$$Ms + Hys < Thresh$$

The variables in the formula are defined as follows:

***Ms*** is the measurement result of channel busy ratio of the transmission resource pool, not taking into account any offsets.

***Hys*** is the hysteresis parameter for this event (i.e. *hysteresis* as defined within *reportConfigNR-SL* for this event).

***Thresh*** is the threshold parameter for this event (i.e. *c1-Threshold* as defined within *reportConfigNR-SL* for this event).

***Ms*** is expressed in decimal from 0 to 1 in steps of 0.01.

***Hys*** is expressed in the same unit as ***Ms***.

***Thresh*** is expressed in the same unit as ***Ms***.

[TS 38.331, clause 5.5.4.12]

The UE shall:

1> consider the entering condition for this event to be satisfied when condition C2-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition C2-2, as specified below, is fulfilled;

Inequality C2-1 (Entering condition)

$$Ms + Hys < Thresh$$

Inequality C2-2 (Leaving condition)

$$Ms - Hys > Thresh$$

The variables in the formula are defined as follows:

***Ms*** is the measurement result of channel busy ratio of the transmission resource pool, not taking into account any offsets.

***Hys*** is the hysteresis parameter for this event (i.e. *hysteresis* as defined within *reportConfigNR-SL* for this event).

**Thresh** is the threshold parameter for this event (i.e. *c2-Threshold* as defined within *reportConfigNR-SL* for this event).

**Ms** is expressed in decimal from 0 to 1 in steps of 0.01.

**Hys** is expressed is in the same unit as **Ms**.

**Thresh** is expressed in the same unit as **Ms**.

[TS 38.331, clause 5.5.5.1]



Figure 5.5.5.1-1: Measurement reporting

The purpose of this procedure is to transfer measurement results from the UE to the network. The UE shall initiate this procedure only after successful AS security activation.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

- 1> set the *measId* to the measurement identity that triggered the measurement reporting;
- 1> for each serving cell configured with *servingCellMO*:
  - ...
  - 2> else:
    - 3> if SSB based serving cell measurements are available:
      - 4> set the *measResultServingCell* within *measResultServingMOList* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on SSB;
    - ...
    - 1> set the *servCellId* within *measResultServingMOList* to include each NR serving cell that is configured with *servingCellMO*, if any;
    - ...
    - 1> if there is at least one applicable transmission resource pool for NR sidelink communication (for *measResultsSL*):
      - 2> set the *measResultsListSL* to include the CBR measurement results in accordance with the following:
        - 3> if the *reportType* is set to *eventTriggered*:
          - 4> include the transmission resource pools included in the *poolsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;
        - 3> else:
          - 4> include the applicable transmission resource pools for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

3> if the corresponding *measObject* concerns NR sidelink communication, then for each transmission resource pool to be reported:

4> set the *sl-poolReportIdentity* to the identity of this transmission resource pool;

4> set the *sl-CBR-ResultsNR* to the CBR measurement results on PSSCH and PSCCH of this transmission resource pool provided by lower layers, if available;

...

1> increment the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* by 1;

1> stop the periodical reporting timer, if running;

1> if the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* is less than the *reportAmount* as defined within the corresponding *reportConfig* for this *measId*:

2> start the periodical reporting timer with the value of *reportInterval* as defined within the corresponding *reportConfig* for this *measId*;

...

1> else:

2> submit the *MeasurementReport* message to lower layers for transmission, upon which the procedure ends..

12.2.3.1.3

Test description

12.2.3.1.3.1

Pre-test conditions

System Simulator:

- SS-NW
  - NR Cell 1
  - System information combination FFS as defined in TS 38.508-1[4] clause 4.4.3.1 is used in NR Cell 1.
- SS-UE
  - Operating as NR sidelink communication transmitting device on the resources that UE is expected to use for transmission.

UE:

- UE is authorised to perform NR sidelink communication.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [4], subclause 4.4A on NR Cell 1.

12.2.3.1.3.2

Test procedure sequence

FFS

Table 12.2.3.1.3.2-3: Main behaviour

St	Procedure	Message Sequence	TP	Verdict
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		U - S	Message		
1	The UE transmits a SidelinkUEInformationNR message to request resources for transmission of NR sidelink communication.	-->	NR RRC: <i>SidelinkUEInformationNR</i>	-	-
2	SS-UE is configured to achieve 50% congestion continuously in consecutive slots according to the transmission pattern shown in FFS	-	-	-	-
3	SS-NW transmits an RRCReconfiguration message with sl-ConfigDedicatedNR to configure transmission resources.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
4	UE transmits an RRCReconfigurationComplete message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>		
5	SS-NW transmits an RRCReconfiguration message with measConfig to setup event C1 triggered CBR measurement and reporting.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
6	UE transmits an RRCReconfigurationComplete message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>		
7	Check: Does the UE transmit a MeasurementReport message in the following 5s?	-->	NR RRC: <i>MeasurementReport</i>	1	F
8	SS-UE is configured to achieve 100% congestion continuously in consecutive slots according to the transmission pattern shown in FFS	-	-	-	-
9	Check: Does the UE transmit a MeasurementReport message with the measured CBR value for indicated resource pool?	-->	NR RRC: <i>MeasurementReport</i>	1	P
10	SS-UE is configured to achieve 50% congestion continuously in consecutive slots according to the transmission pattern shown in FFS	-	-	-	-
11	SS-NW waits for 2s	-	-	-	-
12	Check: Does the UE transmit a MeasurementReport message in the following 5s?	-->	NR RRC: <i>MeasurementReport</i>	2	F
13	SS-NW transmits an RRCReconfiguration message with measConfig to release event C1 and setup event C2 triggered CBR measurement and reporting.	<--	NR RRC: <i>RRCReconfiguration</i>	-	-
14	UE transmits an RRCReconfigurationComplete message.	-->	NR RRC: <i>RRCReconfigurationComplete</i>		
15	Check: Does the UE transmit a MeasurementReport message with the measured CBR value for indicated resource pool?	-->	NR RRC: <i>MeasurementReport</i>	3	P
16	SS-UE is configured to achieve 100% congestion continuously in consecutive slots according to the transmission pattern shown in FFS	-	-	-	-
17	SS-NW waits for 2s	-	-	-	-
18	Check: Does the UE transmit a MeasurementReport message in the following 5s?	-->	NR RRC: <i>MeasurementReport</i>	4	F

12.2.3.1.3.3 Specific message contents

FFS



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# Annex A (informative): Change history

Change history
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Date	Meeting	TDoc	CR	R ev	Cat	Subject/Comment	New version
2017-08	RAN5#76	R5-174427	-	-	-	Introduction of TS 38.523-1.	0.0.1
2017-12	RAN5#77	R5-176926	-	-	-	Addition of new NR PDCP test case 7.3.1.2	0.1.0
2017-12	RAN5#77	R5-176928	-	-	-	Addition of new NR MAC test case 7.1.3.1	0.1.0
2017-12	RAN5#77	R5-177072	-	-	-	Addition of new NR RLC UM test case 7.2.2.1	0.1.0
2017-12	RAN5#77	R5-177073	-	-	-	Addition of new NR RLC UM test case 7.2.2.2	0.1.0
2017-12	RAN5#77	R5-177074	-	-	-	Addition of new NR PDCP test case 7.3.1.1	0.1.0
2017-12	RAN5#77	R5-177075	-	-	-	Addition of new NR MAC test case 7.1.2.1	0.1.0
2018-03	RAN5#77	R5-181171	-	-	-	5GS RRC TC 8.2.2.2.1	0.2.0
2018-03	RAN5#77	R5-181172	-	-	-	5GS RRC TC 8.2.2.2.6	0.2.0
2018-03	RAN5#77	R5-181173	-	-	-	5GS RRC TC 8.2.3.1	0.2.0
2018-03	RAN5#77	R5-181174	-	-	-	5GS RRC TC 8.2.3.16	0.2.0
2018-03	RAN5#77	R5-181175	-	-	-	5GS RRC TC 8.2.5.1	0.2.0
2018-03	RAN5#77	R5-181176	-	-	-	5GS MAC Test case 7.1.1.2	0.2.0
2018-03	RAN5#77	R5-181177	-	-	-	Addition of new NR MAC test case 7.1.3.2	0.2.0
2018-03	RAN5#77	R5-181178	-	-	-	Addition of new NR MAC test case 7.1.3.3	0.2.0
2018-03	RAN5#77	R5-181179	-	-	-	Addition of new NR MAC test case 7.1.3.4	0.2.0
2018-03	RAN5#77	R5-181180	-	-	-	Addition of new NR MAC test case 7.1.3.5	0.2.0
2018-03	RAN5#77	R5-181181	-	-	-	Addition of new NR MAC test case 7.1.3.6	0.2.0
2018-03	RAN5#77	R5-181182	-	-	-	Addition of new NR RLC test case 7.2.3.1	0.2.0
2018-03	RAN5#77	R5-181183	-	-	-	Addition of new NR RLC test case 7.2.3.2	0.2.0
2018-03	RAN5#77	R5-181184	-	-	-	Addition of new NR PDCP test case 7.3.2.1	0.2.0
2018-03	RAN5#77	R5-181185	-	-	-	Addition of new NR PDCP test case 7.3.2.2	0.2.0
2018-03	RAN5#77	R5-181186	-	-	-	Addition of new NR PDCP test case 7.3.2.3	0.2.0
2018-03	RAN5#77	R5-181187	-	-	-	Addition of new NR PDCP test case 7.3.3.1	0.2.0
2018-03	RAN5#77	R5-181188	-	-	-	Addition of new NR PDCP test case 7.3.3.2	0.2.0
2018-03	RAN5#77	R5-181189	-	-	-	Addition of new NR PDCP test case 7.3.3.3	0.2.0
2018-03	RAN5#77	R5-181201	-	-	-	Addition of new NR MAC test case 7.1.5.1	0.2.0
2018-03	RAN5#77	R5-181202	-	-	-	Addition of new NR MAC test case 7.1.5.2	0.2.0
2018-03	RAN5#77	R5-181203	-	-	-	Addition of new NR PDCP test case 7.3.5.1	0.2.0
2018-03	RAN5#77	R5-181204	-	-	-	Addition of new NR RRC test case 8.2.2.2.5	0.2.0
2018-03	RAN5#77	R5-181205	-	-	-	Addition of new NR RRC test case 8.2.3.5	0.2.0
2018-03	RAN5#77	R5-181206	-	-	-	Update of NR MAC test cases	0.2.0
2018-03	RAN5#77	R5-181207	-	-	-	Update of NR RLC test cases	0.2.0
2018-03	RAN5#77	R5-181208	-	-	-	Update of NR PDCP test cases	0.2.0
2018-03	RAN5#77	R5-181209	-	-	-	5GS MAC Test case 7.1.5.3	0.2.0
2018-03	RAN5#77	R5-181312	-	-	-	Addition of new NR PDCP test case 7.3.5.2	0.2.0
2018-03	RAN5#77	R5-181334	-	-	-	Addition of new NR PDCP test case 7.3.4.2	0.2.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181805	-	-	-	Corrections to RRC TC 8.2.3.1 Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181806	-	-	-	5GS RRC TC 8.2.1.2	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181914	-	-	-	Addition of 5GS NR RRC test case 8.2.3.6	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181951	-	-	-	Correction to RLC UM Test cases	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181952	-	-	-	Correction to RLC AM Test cases	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181967	-	-	-	Correction to PDCP ciphering test cases	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181980	-	-	-	5GS RRC TC 8.2.2.2.9	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181981	-	-	-	Corrections to RRC TC 8.2.3.16 Handover with PSCell release / SCG DRB	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181982	-	-	-	5GS RRC TC 8.2.3.2	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181983	-	-	-	5GS RRC TC 8.2.3.3	0.3.0
2018-04	RAN5#2- 5G-NR Adhoc	R5-181984	-	-	-	5GS RRC TC 8.2.3.4	0.3.0

	5G-NR Adhoc						
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2018-04	RAN5#2-5G-NR Adhoc	R5-181986	-	-	-	Addition of new NR RRC test case 8.2.2.2.4	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181988	-	-	-	Addition of new NR NAS test case for dedicated EPS bearer context activation	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181991	-	-	-	Addition of text to clarify that 5GS requirements may be implicitly tested in other specs	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181992	-	-	-	New NAS test case EPS bearer resource allocation / New EPS bearer context	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181994	-	-	-	Addition of new NR MAC test case 7.1.4.1.1	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181995	-	-	-	Addition of new NR MAC test case 7.1.4.1.2	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181996	-	-	-	Addition of new NR MAC test case 7.1.4.1.3	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181997	-	-	-	Addition of new NR MAC test case 7.1.4.1.4	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181998	-	-	-	Addition of new NR RLC test case 7.2.2.6	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-181999	-	-	-	Addition of new NR RLC test case 7.2.3.5	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182050	-	-	-	Addition of new NR RLC test case 7.2.2.5	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182051	-	-	-	Addition of new NR RLC test case 7.2.3.6	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182052	-	-	-	Addition of new NR RLC test case 7.2.3.7	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182053	-	-	-	Addition of new NR RLC test case 7.2.3.8	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182054	-	-	-	Addition of new NR RLC test case 7.2.3.3	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182055	-	-	-	Addition of new NR RLC test case 7.2.3.4	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182056	-	-	-	Addition of new NR RRC test case 8.2.3.9	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182057	-	-	-	Addition of new NR RRC test case 8.2.3.10	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182058	-	-	-	Addition of new NR RRC test case 8.2.3.11	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182059	-	-	-	Addition of new NR RRC test case 8.2.3.12	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182060	-	-	-	Correction to MAC test case 7.1.2.1	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182061	-	-	-	Addition of new NR RRC test case 8.2.3.19	0.3.0
2018-04	RAN5#2-5G-NR	R5-182076	-	-	-	5GS PDCP Test case 7.3.4.1	0.3.0

	Adhoc					
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2018-04	RAN5#2-5G-NR Adhoc	R5-182077	-	-	-	5GS PDCP Test case 7.3.5.4	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182078	-	-	-	5GS RLC test case 7.2.3.11	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182079	-	-	-	5GS RLC test case 7.2.3.12	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182080	-	-	-	Addition of new NR RRC test case 8.2.3.7	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182081	-	-	-	Addition of new NR RLC test case 7.2.2.3	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182082	-	-	-	Addition of new NR RLC test case 7.2.2.4	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182083	-	-	-	Addition of new NR RRC test case 8.2.3.17	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182085	-	-	-	Correction to PDCP integrity protection test cases	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182089	-	-	-	5GS RRC TC 8.2.5.5	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182100	-	-	-	5GS RRC TC 8.2.5.6	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182101	-	-	-	5GS RRC TC 8.2.5.7	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182102	-	-	-	5GS RRC TC 8.2.2.2.7	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182103	-	-	-	Corrections to RRC TC 8.2.5.1 RRC connection reconfiguration / PSCell addition failure	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182104	-	-	-	Corrections to RRC TC 8.2.2.2.1 PSCell addition, modification and release / SCG DRB	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182105	-	-	-	Corrections to RRC TC 8.2.2.2.6 Bearer Modification / SCG DRB / Split DRB Reconfiguration	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182106	-	-	-	Addition of new NR RRC test case 8.2.2.1.2	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182115	-	-	-	Introduction of 5GS RRC TC 8.2.4.3.1	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182116	-	-	-	Adding NR test case 8.2.2.1.1	0.3.0
2018-04	RAN5#2-5G-NR Adhoc	R5-182117	-	-	-	Adding NR test case 8.2.2.1.3	0.3.0
2018-04	post RAN5#2-5G-NR Adhoc	-	-	-	-	Editorial update to apply with the 3GPP drafting rules (styles)	0.3.1
2018-05	RAN5#79	<a href="#">R5-183094</a>	-	-	-	Addition of UE power headroom reporting test case 7.1.1.3.7	1.0.0
2018-05	RAN5#79	<a href="#">R5-183101</a>	-	-	-	Addition of DRX Operation test case 7.1.1.5.4	1.0.0
2018-05	RAN5#79	<a href="#">R5-183102</a>	-	-	-	Addition of Correct handling of DL assignment/Semi-persistent test case 7.1.1.6.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183103</a>	-	-	-	Addition of AM RLC test case 7.1.2.3.10	1.0.0
2018-05	RAN5#79	<a href="#">R5-183227</a>	-	-	-	Editorial updates to 38.523-1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183229</a>	-	-	-	Correction to PDCP Test case - PDCP reordering/Maximum re-ordering delay below t-Reordering/ t-Reordering timer operations	1.0.0

2018-05	RAN5#79	<a href="#">R5-183109</a>	-	-	-	Update to MAC Test case - Random access procedure / Successful/ C-RNTI Based/Preamble selected by MAC itself	1.0.0
2018-05	RAN5#79	<a href="#">R5-183111</a>	-	-	-	Update RLC test case - AM RLC / Re-transmission of RLC PDU with and without re-segmentation	1.0.0
2018-05	RAN5#79	<a href="#">R5-183112</a>	-	-	-	Correction to MAC Test case - DRX operation / Short cycle configured / Parameters configured by RRC	1.0.0
2018-05	RAN5#79	<a href="#">R5-183113</a>	-	-	-	Correction to PDCP Test case - PDCP handover / Lossless handover / PDCP sequence number maintenance/PDCP status report to convey the information on missing or acknowledged PDCP SDUs at handover/ In-order delivery and duplicate elimination in the downlink	1.0.0
2018-05	RAN5#79	<a href="#">R5-182497</a>	-	-	-	Corrections to RRC TC - BandwidthPart Configuration / SCG	1.0.0
2018-05	RAN5#79	<a href="#">R5-183230</a>	-	-	-	Corrections to RRC TC - PSCell addition, modification and release / SCG DRB	1.0.0
2018-05	RAN5#79	<a href="#">R5-183114</a>	-	-	-	Corrections to RRC TC - Bearer Modification / Handling for bearer type change with security key change	1.0.0
2018-05	RAN5#79	<a href="#">R5-183115</a>	-	-	-	Corrections to RRC TC - Bearer Modification / Uplink data path / Split DRB Reconfiguration	1.0.0
2018-05	RAN5#79	<a href="#">R5-183117</a>	-	-	-	Corrections to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells	1.0.0
2018-05	RAN5#79	<a href="#">R5-183116</a>	-	-	-	Corrections to RRC TC - RRC connection reconfiguration / PSCell addition failure	1.0.0
2018-05	RAN5#79	<a href="#">R5-183231</a>	-	-	-	Corrections to RRC TC - NR SCG Failure Information / RLC- MaxNumRetx	1.0.0
2018-05	RAN5#79	<a href="#">R5-183118</a>	-	-	-	Corrections to RRC TC - SCG Reconfiguration Failure / SRB3	1.0.0
2018-05	RAN5#79	<a href="#">R5-183119</a>	-	-	-	Corrections to RRC TC - SCG Reconfiguration Failure / SRB1	1.0.0
2018-05	RAN5#79	<a href="#">R5-182508</a>	-	-	-	Void RRC TC - Handover with PSCell release / SCG DRB	1.0.0
2018-05	RAN5#79	<a href="#">R5-182509</a>	-	-	-	Void RRC TC - Bearer Modification / SCG DRB / Split DRB Reconfiguration	1.0.0
2018-05	RAN5#79	<a href="#">R5-183120</a>	-	-	-	Correction to NR RRC test case 8.2.3.17	1.0.0
2018-05	RAN5#79	<a href="#">R5-183121</a>	-	-	-	Correction to NR RRC test case 8.2.3.19	1.0.0
2018-05	RAN5#79	<a href="#">R5-183228</a>	-	-	-	Correction to NR MAC test case 7.1.1.3.2	1.0.0
2018-05	RAN5#79	<a href="#">R5-183122</a>	-	-	-	Correction to NR PDCP test case 7.1.3.4.2	1.0.0
2018-05	RAN5#79	<a href="#">R5-183123</a>	-	-	-	Addition of new NR RRC test case 8.2.5.2.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183124</a>	-	-	-	Addition of new NR RRC test case 8.2.5.4.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-182601</a>	-	-	-	Removal of NR RRC test case 8.2.2.2.5	1.0.0
2018-05	RAN5#79	<a href="#">R5-183126</a>	-	-	-	Addition of new 5GS RRC TC 8.2.4.3.1.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183127</a>	-	-	-	Addition of new NR RRC test case - Bearer Modification / Handling for bearer type change without security key change / EN-DC	1.0.0
2018-05	RAN5#79	<a href="#">R5-182652</a>	-	-	-	Void RRC TC - Bearer Modification / MCG DRB / SCG DRB Reconfiguration	1.0.0
2018-05	RAN5#79	<a href="#">R5-182774</a>	-	-	-	Addition of 5GS NR RRC test case 8.2.3.8.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183130</a>	-	-	-	Removal of RRC TC 8.2.4.3.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-182798</a>	-	-	-	Update of 5GS NR RRC test case 8.2.3.6	1.0.0
2018-05	RAN5#79	<a href="#">R5-183232</a>	-	-	-	Addition of 5GS NR RRC test case 8.2.2.6.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183233</a>	-	-	-	Addition of 5GS NR PDCP test case 7.1.3.5.3	1.0.0
2018-05	RAN5#79	<a href="#">R5-183132</a>	-	-	-	Update of NR RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells / RSRQ based measurements	1.0.0
2018-05	RAN5#79	<a href="#">R5-183133</a>	-	-	-	Update of NR RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Periodic reporting / Measurement of NR cells	1.0.0
2018-05	RAN5#79	<a href="#">R5-183134</a>	-	-	-	Update of NR RRC TC - Measurement configuration control and reporting / Event A1 / Measurement of NR PSCell	1.0.0
2018-05	RAN5#79	<a href="#">R5-183135</a>	-	-	-	Addition of NR RRC TC - PSCell addition, modification and release / Split DRB / EN-DC	1.0.0
2018-05	RAN5#79	<a href="#">R5-183137</a>	-	-	-	Addition of 5GS NR RRC test case 8.2.1.1.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183138</a>	-	-	-	Addition of new NR MAC UL TBS test case 7.1.1.4.2.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183139</a>	-	-	-	Addition of new NR MAC UL TBS test case 7.1.1.4.2.2	1.0.0
2018-05	RAN5#79	<a href="#">R5-183140</a>	-	-	-	Addition of new NR MAC UL TBS test case 7.1.1.4.2.3	1.0.0
2018-05	RAN5#79	<a href="#">R5-183141</a>	-	-	-	Addition of new NR MAC UL TBS test case 7.1.1.4.2.4	1.0.0
2018-05	RAN5#79	<a href="#">R5-183142</a>	-	-	-	Addition of Layer 2 test case specific parameters	1.0.0
2018-05	RAN5#79	<a href="#">R5-183143</a>	-	-	-	Correction to MAC Pre-test conditions	1.0.0
2018-05	RAN5#79	<a href="#">R5-183144</a>	-	-	-	Correction to RLC Pre-test conditions	1.0.0
2018-05	RAN5#79	<a href="#">R5-183145</a>	-	-	-	Correction to PDCP Pre-test conditions	1.0.0
2018-05	RAN5#79	<a href="#">R5-183146</a>	-	-	-	Correction to MAC RACH Test Cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-182940</a>	-	-	-	Correction to MAC DL Data Transfer test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183147</a>	-	-	-	Correction to MAC UL Data Transfer test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183148</a>	-	-	-	Correction to MAC DL-SCH TBS test cases	1.0.0

2018-05	RAN5#79	<a href="#">R5-183149</a>	-	-	-	Correction to RLC UM Test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183150</a>	-	-	-	Correction to RLC AM Test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-182945</a>	-	-	-	Corrections to PDCP sequence number test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183151</a>	-	-	-	Correction to PDCP integrity protection test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-182947</a>	-	-	-	Correction to PDCP Ciphering test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183152</a>	-	-	-	Corrections to PDCP other test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183153</a>	-	-	-	Addition of new NR RACH test case 7.1.1.1.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-182966</a>	-	-	-	Correction to NR RLC test case 7.1.2.3.4	1.0.0
2018-05	RAN5#79	<a href="#">R5-183154</a>	-	-	-	Correction to PDCP test case 7.1.3.5.2	1.0.0
2018-05	RAN5#79	<a href="#">R5-183155</a>	-	-	-	Correction to NR MAC DRX Test cases	1.0.0
2018-05	RAN5#79	<a href="#">R5-183156</a>	-	-	-	Correction to NR RRC intra frequency measurement Test case 8.2.3.9	1.0.0
2018-05	RAN5#79	<a href="#">R5-183157</a>	-	-	-	Correction to NR RRC inter frequency measurement Test case 8.2.3.10	1.0.0
2018-05	RAN5#79	<a href="#">R5-183016</a>	-	-	-	Removal of NR RRC test case 8.2.3.11	1.0.0
2018-05	RAN5#79	<a href="#">R5-183017</a>	-	-	-	Removal of NR RRC test case 8.2.3.12	1.0.0
2018-05	RAN5#79	<a href="#">R5-183129</a>	-	-	-	Addition of new 5GS RRC TC 8.2.3.13.1	1.0.0
2018-05	RAN5#79	<a href="#">R5-183136</a>	-	-	-	Correction to NR RRC test case 8.2.3.5	1.0.0
2018-05	RAN5#79	<a href="#">R5-183263</a>	-	-	-	Addition of new NR NAS test case Default EPS bearer context activation	1.0.0
2018-05	RAN5#79	<a href="#">R5-183265</a>	-	-	-	Updates to session management TC 10.2.2.1	1.0.0
2018-06	RAN#80	RP-181210	-	-	-	put under revision control as v15.0.0 with small editorial changes	15.0.0
2018-09	RAN#81	R5-184226	0010	-	F	Addition of Correct handling of Configured UL grant Type 1 test case 7.1.1.6.2	15.1.0
2018-09	RAN#81	R5-184227	0011	-	F	Addition of Correct handling of Configured UL grant Type 2 test case 7.1.1.6.3	15.1.0
2018-09	RAN#81	R5-184228	0012	-	F	CR of Correct handling of DL assignment Semi persistent test case 7.1.1.6.1	15.1.0
2018-09	RAN#81	R5-184229	0013	-	F	CR of UE power headroom reporting test case 7.1.1.3.7	15.1.0
2018-09	RAN#81	R5-184343	0020	-	F	Correction to 5GS PDCP Test case 7.1.3.4.1 PDCP handover / Lossless handover / PDCP sequence number maintenance / PDCP status report to convey the information on missing or acknowledged PDCP SDUs at handover / In-order delivery and duplicate elimination in the downlink	15.1.0
2018-09	RAN#81	R5-184344	0021	-	F	Correction to 5GS PDCP Test case 7.1.3.5.4 PDCP reordering / Maximum re-ordering delay below t-Reordering / t-Reordering timer operations	15.1.0
2018-09	RAN#81	R5-184353	0023	-	F	Corrections to RRC TC - BandwidthPart Configuration / SCG / EN-DC	15.1.0
2018-09	RAN#81	R5-184500	0031	-	F	Addition of new 5GS RRC TC 8.2.4.3.1.3	15.1.0
2018-09	RAN#81	R5-184517	0032	-	F	Correction to NR PDCP test case 7.1.3.4.2	15.1.0
2018-09	RAN#81	R5-184523	0036	-	F	Corrections to MAC TBS test cases	15.1.0
2018-09	RAN#81	R5-184527	0040	-	F	Addition of new MAC test case for Reset	15.1.0
2018-09	RAN#81	R5-184680	0055	-	F	Update of RRC SCG failure TC 8.2.5.5.1	15.1.0
2018-09	RAN#81	R5-184681	0056	-	F	Update of RRC SCG failure TC 8.2.5.6.1	15.1.0
2018-09	RAN#81	R5-184760	0059	-	F	Correction to RRC TC - PSCell addition, modification and release / Split DRB / EN-DC	15.1.0
2018-09	RAN#81	R5-184761	0060	-	F	Correction to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Periodic reporting / Measurement of NR cells / EN-DC	15.1.0
2018-09	RAN#81	R5-184763	0061	-	F	Correction to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells / RSRQ based measurements / EN-DC	15.1.0
2018-09	RAN#81	R5-184769	0063	-	F	Update of 5GS NR RRC test case 8.2.2.6.1	15.1.0
2018-09	RAN#81	R5-185059	0001	1	F	Correction to NR MAC test case 7.1.1.3.2	15.1.0
2018-09	RAN#81	R5-185060	0004	1	F	Addition of Correct Handling of DL HARQ process PDSCH Aggregation test case 7.1.1.2.2	15.1.0
2018-09	RAN#81	R5-185061	0005	1	F	Addition of NR CA reconfiguration test case 8.2.4.2.1.1	15.1.0
2018-09	RAN#81	R5-185062	0006	1	F	Addition of NR CA reconfiguration test case 8.2.4.2.1.2	15.1.0
2018-09	RAN#81	R5-185064	0015	1	F	Addition of 5GS NR SDAP test case 7.1.4.1	15.1.0
2018-09	RAN#81	R5-185065	0016	1	F	Correction to 5GS MAC Test case 7.1.1.1.2 Random access procedure / Successful / C-RNTI Based / Preamble selected by MAC itself	15.1.0
2018-09	RAN#81	R5-185066	0017	1	F	Correction to 5GS MAC Test case 7.1.1.5.3 DRX operation / Short cycle configured / Parameters configured by RRC	15.1.0
2018-09	RAN#81	R5-185067	0018	1	F	Correction to 5GS RLC Test case 7.1.2.3.10 AM RLC / Re-transmission of RLC PDU with and without re-segmentation	15.1.0
2018-09	RAN#81	R5-185068	0019	1	F	Correction to 5GS RLC Test case 7.1.2.3.11 AM RLC / RLC re-establishment procedure	15.1.0
2018-09	RAN#81	R5-185069	0022	1	F	Addition of NR CA / NR SCell addition / modification / release /	15.1.0

					Success	test cases 8.2.4.1.1.1, 8.2.4.1.1.2 and 8.2.4.1.1.3	
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2018-09	RAN#81	R5-185070	0027	1	F	Corrections to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells / EN-DC	15.1.0
2018-09	RAN#81	R5-185071	0029	1	F	Correction to 5GS RRC TC 8.2.4.3.1.1	15.1.0
2018-09	RAN#81	R5-185072	0030	1	F	Addition of 5GS RRC TC 8.2.4.3.1.2	15.1.0
2018-09	RAN#81	R5-185073	0033	1	F	Corrections to Layer 2 test cases	15.1.0
2018-09	RAN#81	R5-185074	0034	1	F	Corrections to MAC test case 7.1.2.2.1	15.1.0
2018-09	RAN#81	R5-185075	0035	1	F	Corrections to MAC test case 7.1.2.3.1	15.1.0
2018-09	RAN#81	R5-185076	0037	1	F	Addition of new MAC RACH test case for PDCCH order	15.1.0
2018-09	RAN#81	R5-185077	0039	1	F	Addition of new MAC test case for Scell Activation Deactivation	15.1.0
2018-09	RAN#81	R5-185078	0041	1	F	Addition of new MAC UL TBS test case with transform precoding configured	15.1.0
2018-09	RAN#81	R5-185079	0042	1	F	Correction to default pre-test conditions for UM RLC test cases	15.1.0
2018-09	RAN#81	R5-185080	0043	1	F	New NAS test case 9.1.5.1.12	15.1.0
2018-09	RAN#81	R5-185082	0045	1	F	Correction to NR PDCP test case 7.1.3.5.1	15.1.0
2018-09	RAN#81	R5-185083	0046	1	F	Correction to NR RLC test case 7.1.2.3.3 and 7.1.2.3.4	15.1.0
2018-09	RAN#81	R5-185089	0049	1	F	Corrections to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Event B2 / Measurement of NR cells / EN-DC	15.1.0
2018-09	RAN#81	R5-185090	0050	1	F	CR of AM RLC test case 7.1.2.3.10	15.1.0
2018-09	RAN#81	R5-185091	0051	1	F	Update of RRC SCG failure TC 8.2.5.1.1	15.1.0
2018-09	RAN#81	R5-185092	0052	1	F	Update of RRC SCG failure TC 8.2.5.2.1	15.1.0
2018-09	RAN#81	R5-185093	0053	1	F	Update of RRC SCG failure TC 8.2.5.3.1	15.1.0
2018-09	RAN#81	R5-185094	0054	1	F	Update of RRC SCG failure TC 8.2.5.4.1	15.1.0
2018-09	RAN#81	R5-185095	0057	1	F	Addition of 5GS NR SDAP test case 7.1.4.2	15.1.0
2018-09	RAN#81	R5-185096	0064	1	F	Update of 5GS NR RRC test case 8.2.3.6.1	15.1.0
2018-09	RAN#81	R5-185097	0066	1	F	Update of 5GS NR RRC test case 8.2.3.8.1	15.1.0
2018-09	RAN#81	R5-185098	0067	1	F	Update of 5GS NR RRC test case 8.2.1.1.1	15.1.0
2018-09	RAN#81	R5-185099	0068	1	F	L2 Preamble Parameter Update for Multi-PDN configuration	15.1.0
2018-09	RAN#81	R5-185100	0069	1	F	Correction to NR RLC test cases 7.1.2.2.3 and 7.1.2.2.4	15.1.0
2018-09	RAN#81	R5-185101	0070	1	F	Correction to NR RRC test case 8.2.3.14.1	15.1.0
2018-09	RAN#81	R5-185148	0007	1	F	Addition of NR CA reconfiguration test case 8.2.4.2.1.3	15.1.0
2018-09	RAN#81	R5-185149	0024	1	F	Corrections to RRC TC - PSCell addition, modification and release / SCG DRB / EN-DC	15.1.0
2018-09	RAN#81	R5-185150	0025	1	F	Corrections to RRC TC - Bearer Modification / Handling for bearer type change with security key change / EN-DC	15.1.0
2018-09	RAN#81	R5-185151	0026	1	F	Corrections to RRC TC - Bearer Modification / Uplink data path / Split DRB Reconfiguration / EN-DC	15.1.0
2018-09	RAN#81	R5-185152	0038	1	F	Addition of new MAC test case for Power Headroom report	15.1.0
2018-09	RAN#81	R5-185153	0047	1	F	Addition of RRC Default Pre-test conditions for NSA	15.1.0
2018-09	RAN#81	R5-185154	0058	1	F	Correction to RRC TC - Measurement configuration control and reporting / Event A1 / Measurement of NR PSCell / EN-DC	15.1.0
2018-09	RAN#81	R5-185155	0062	1	F	Updates to NAS test case 10.2.1.2	15.1.0
2018-09	RAN#81	R5-185167	0071	1	F	Update to EPS SM Test case for Multi-PDN	15.1.0
2018-12	RAN#82	R5-186649	0157	-	F	Correction to NR PDCP test case 7.1.3.5.1	15.2.0
2018-12	RAN#82	R5-186650	0158	-	F	Correction to NR PDCP test case 7.1.3.5.2	15.2.0
2018-12	RAN#82	R5-186679	0163	-	F	Corrections to PDCP test case 7.1.3.5.3	15.2.0
2018-12	RAN#82	R5-186725	0167	-	F	Correction to 5GS test case 7.1.2.2.5	15.2.0
2018-12	RAN#82	R5-186801	0178	-	F	Update RRC TC 8.2.2.2.1 - Split SRB Establishment and Release / EN-DC	15.2.0
2018-12	RAN#82	R5-186802	0179	-	F	Update RRC TC 8.2.2.7.1 - Bearer Modification / Handling for bearer type change without security key change / EN-DC	15.2.0
2018-12	RAN#82	R5-186803	0180	-	F	Update RRC TC8.2.3.7.1 - Measurement configuration control and reporting / Event A4 (intra-frequency, inter-frequency and inter-band measurements) / Measurement of Neighbour NR cell / EN-DC	15.2.0
2018-12	RAN#82	R5-186872	0181	-	F	Removal of RRC SCG failure TC 8.2.5.5.1	15.2.0
2018-12	RAN#82	R5-186873	0182	-	F	Removal of RRC SCG failure TC 8.2.5.6.1	15.2.0
2018-12	RAN#82	R5-186890	0185	-	F	Correction to NR RRC test case 8.2.3.14.1	15.2.0
2018-12	RAN#82	R5-186891	0186	-	F	Correction to NR RRC test case 8.2.3.13.1	15.2.0
2018-12	RAN#82	R5-186892	0187	-	F	Correction to NR PDCP test case 7.1.3.4.2	15.2.0
2018-12	RAN#82	R5-186995	0228	-	F	CR of test case 8.2.4.2_NR CA release_Resubmission of 186101	15.2.0
2018-12	RAN#82	R5-187104	0229	-	F	Correction to MAC test cases	15.2.0
2018-12	RAN#82	R5-187105	0230	-	F	Correction to RLC UM test cases	15.2.0
2018-12	RAN#82	R5-187106	0231	-	F	Correction to RLC AM test cases	15.2.0
2018-12	RAN#82	R5-187236	0235	-	F	Update RRC TC 8.2.1.2.1 - BandwidthPart Configuration / SCG / EN-DC	15.2.0
2018-12	RAN#82	R5-187237	0236	-	F	Update RRC TC 8.2.2.4.1 - PSCell addition, modification and release / SCG DRB / EN-DC	15.2.0
2018-12	RAN#82	R5-187238	0237	-	F	Update RRC TC 8.2.2.8.1 - Bearer Modification / Handling for bearer type change with security key change / EN-DC	15.2.0



2018-12	RAN#82	R5-187239	0238	-	F	Update RRC TC 8.2.2.9.1 - Bearer Modification / Uplink data path / Split DRB Reconfiguration / EN-DC	15.2.0
2018-12	RAN#82	R5-187248	0247	-	F	Correction to MAC Test case 7.1.1.1.2 Random access procedure / Successful / C-RNTI Based / Preamble selected by MAC itself	15.2.0
2018-12	RAN#82	R5-187249	0248	-	F	Correction to MAC Test case 7.1.1.5.3 DRX operation / Short cycle configured / Parameters configured by RRC	15.2.0
2018-12	RAN#82	R5-187250	0249	-	F	Correction to RLC Test case 7.1.2.3.10 AM RLC / Re-transmission of RLC PDU with and without re-segmentation	15.2.0
2018-12	RAN#82	R5-187251	0250	-	F	Correction to RLC Test case 7.1.2.3.11 AM RLC / RLC re-establishment procedure	15.2.0
2018-12	RAN#82	R5-187252	0251	-	F	Correction to PDCP Test case 7.1.3.4.1 PDCP handover / Lossless handover / PDCP sequence number maintenance / PDCP status report to convey the information on missing or acknowledged PDCP SDUs at handover / In-order delivery and duplicate elimination	15.2.0
2018-12	RAN#82	R5-187254	0253	-	F	Update RRC TCs 8.2.4.1.1.1, 8.2.4.1.1.2 and 8.2.4.1.1.3 NR CA / NR SCell addition / modification / release / Success	15.2.0
2018-12	RAN#82	R5-187255	0254	-	F	Correction to EN-DC NAS test case 10.2.1.1 - Default EPS bearer context activation	15.2.0
2018-12	RAN#82	R5-187302	0260	-	F	Correction to test case 8.2.4.3.1.1	15.2.0
2018-12	RAN#82	R5-187410	0273	-	F	Update of 5GS NR RRC test case 8.2.2.6.1	15.2.0
2018-12	RAN#82	R5-187411	0274	-	F	Addition of 5GS NR MAC test case 7.1.1.3.9	15.2.0
2018-12	RAN#82	R5-187492	0278	-	F	Correction to test case 8.2.2.1.1	15.2.0
2018-12	RAN#82	R5-187497	0279	-	F	Correction to test case 8.2.2.3.1	15.2.0
2018-12	RAN#82	R5-187528	0285	-	F	Update to RRC TC - PSCell addition, modification and release / Split DRB / EN-DC	15.2.0
2018-12	RAN#82	R5-187530	0286	-	F	Update to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells / RSRQ based measurements / EN-DC	15.2.0
2018-12	RAN#82	R5-187534	0287	-	F	Update to RRC TC - Measurement configuration control and reporting / Inter-RAT measurements / Periodic reporting / Measurement of NR cells / EN-DC	15.2.0
2018-12	RAN#82	R5-187540	0290	-	F	Update to 5G-NR RRC TCs for Multi-PDN support and specific message content IEs	15.2.0
2018-12	RAN#82	R5-187611	0294	-	F	Correction to MAC TBS test cases	15.2.0
2018-12	RAN#82	R5-187686	0283	1	F	Adding test case 6.1.1.7	15.2.0
2018-12	RAN#82	R5-187688	0202	1	F	Addition of NR test case 7.1.1.1.3 SI Request	15.2.0
2018-12	RAN#82	R5-187689	0203	1	F	Addition of NR test case 7.1.1.1.6 Random access	15.2.0
2018-12	RAN#82	R5-187690	0204	1	F	Addition of NR test case 7.1.1.2.3 CCCH HARQ	15.2.0
2018-12	RAN#82	R5-187691	0213	1	F	CR of NR test case 7.1.2.3.9 RLC Reassembling	15.2.0
2018-12	RAN#82	R5-187692	0252	1	F	Correction to PDCP Test case 7.1.3.5.4 PDCP reordering / Maximum re-ordering delay below t-Reordering / t-Reordering timer operations	15.2.0
2018-12	RAN#82	R5-187693	0234	1	F	Correction to SDAP test cases	15.2.0
2018-12	RAN#82	R5-187695	0243	1	F	Addition of 5GS SA RRC TC 8.1.1.1.1	15.2.0
2018-12	RAN#82	R5-187696	0246	1	F	Addition of 5GS SA RRC TC 8.1.5.2.1	15.2.0
2018-12	RAN#82	R5-187698	0159	1	F	Correction to NR RRC test case 8.2.3.5.1	15.2.0
2018-12	RAN#82	R5-187699	0160	1	F	Correction to NR RRC test case 8.2.3.9.1 and 8.2.3.10.1	15.2.0
2018-12	RAN#82	R5-187700	0239	1	F	Update RRC TC 8.2.3.1.1 - Measurement configuration control and reporting / Inter-RAT measurements / Event B1 / Measurement of NR cells / EN-DC	15.2.0
2018-12	RAN#82	R5-187701	0272	1	F	Update RRC TC 8.2.3.12.1	15.2.0
2018-12	RAN#82	R5-187702	0276	1	F	Update of 5GS NR RRC test case 8.2.3.6.1	15.2.0
2018-12	RAN#82	R5-187703	0277	1	F	Update of 5GS NR RRC test case 8.2.3.8.1	15.2.0
2018-12	RAN#82	R5-187704	0288	1	F	Update to RRC TC - Measurement configuration control and reporting / Event A1 / Measurement of NR PSCell / EN-DC	15.2.0
2018-12	RAN#82	R5-187705	0289	1	F	Update to 5G-NR RRC measurement report TCs for FR1/FR2 cell power level	15.2.0
2018-12	RAN#82	R5-187706	0168	1	F	Updates to EN-DC TC 8.2.5.3.1	15.2.0
2018-12	RAN#82	R5-187707	0140	1	F	Corrections to NAS test case 9.1.5.1.14	15.2.0
2018-12	RAN#82	R5-187778	0284	1	F	Adding test case 6.1.1.8	15.2.0
2018-12	RAN#82	R5-187779	0226	1	F	Addition of NR test case 7.1.1.1.4 Beam Failure	15.2.0
2018-12	RAN#82	R5-187780	0227	1	F	Addition of NR test case 7.1.1.1.5 SUL	15.2.0
2018-12	RAN#82	R5-187781	0281	1	F	Correction to NR MAC test case 7.1.1.3.2	15.2.0
2018-12	RAN#82	R5-187782	0291	1	F	Addition of 5GS NR MAC test case 7.1.1.8.1	15.2.0
2018-12	RAN#82	R5-187784	0184	1	F	Correction to the default Pre-Test Conditions for AM and UM RLC test cases	15.2.0
2018-12	RAN#82	R5-187785	0232	1	F	Correction to PDCP Ciphering test cases	15.2.0
2018-12	RAN#82	R5-187786	0233	1	F	Correction to PDCP Integrity test cases	15.2.0
2018-12	RAN#82	R5-187787	0216	1	F	Addition of NR test case 8.1.1.2.3 T300 expiry	15.2.0
2018-12	RAN#82	R5-187789	0245	1	F	Addition of 5GS SA RRC TC 8.1.1.2.5	15.2.0
2018-12	RAN#82	R5-187790	0275	1	F	Addition of 5GS NR RRC test case 8.1.1.3.2	15.2.0



2018-12	RAN#82	R5-187792	0224	1	F	Addition of NR test case 8.2.3.11.1_gapFR1	15.2.0
2018-12	RAN#82	R5-187794	0221	1	F	Addition of NR test case 8.1.5.3.1_PWS notification	15.2.0
2018-12	RAN#82	R5-187795	0240	1	F	Update RRC SCG failure TC 8.2.5.1.1	15.2.0
2018-12	RAN#82	R5-187797	0263	1	F	Addition of new 5GC TC 9.1.6.1.1	15.2.0
2018-12	RAN#82	R5-188159	0222	2	F	Addition of NR test case 9.1.5.1.1_Registration Request	15.2.0
2018-12	RAN#82	R5-188187	0296	-	F	Correction to NR MAC DRX test cases 7.1.1.5.1 and 7.1.1.5.2	15.2.0
2018-12	RAN#82	R5-188188	0217	2	F	Addition of NR test case 8.1.1.3.1_Redirection to NR	15.2.0
2018-12	RAN#82	R5-188190	0225	2	F	Addition of NR test case 8.2.3.11.2_gapFR2	15.2.0
2019-01	RAN#82	R5-188192	0205	2	F	Addition of NR test case 7.1.1.2.4_BCCH HARQ	15.2.1
2019-01	RAN#82	R5-188193	0295	2	F	Correction to Layer 2 Pre Test conditions	15.2.1
2019-01	RAN#82	R5-188194	0218	2	F	Addition of NR test case 8.1.3.1.1_Event A1	15.2.1
2019-01	RAN#82	R5-188195	0183	2	F	Update to 5G TC TA registration update	15.2.1
2019-01	RAN#82	R5-188202	0280	2	F	Update of 5GS NR RRC test case 8.2.1.1.1	15.2.1
2019-03	RAN#83	R5-191197	0421	-	F	Correction to 5GS RLC Test case 7.1.2.2.5	15.3.0
2019-03	RAN#83	R5-191198	0422	-	F	Correction to 5GS RLC Test case 7.1.2.3.8	15.3.0
2019-03	RAN#83	R5-191199	0423	-	F	Correction to 5GS RLC Test case 7.1.2.3.9	15.3.0
2019-03	RAN#83	R5-191200	0424	-	F	Correction to EN-DC RRC test case 8.2.5.3.1	15.3.0
2019-03	RAN#83	R5-191202	0426	-	F	Correction to 5GS RLC Test case 7.1.2.3.10	15.3.0
2019-03	RAN#83	R5-191203	0427	-	F	Correction to EN-DC RRC test case 8.2.2.2.1	15.3.0
2019-03	RAN#83	R5-191353	0431	-	F	Correcting test case 7.1.1.3.1	15.3.0
2019-03	RAN#83	R5-191393	0445	-	F	Correction to NR test case 7.1.1.1.6-Random access procedure	15.3.0
2019-03	RAN#83	R5-191397	0449	-	F	Correction to NR test case 7.1.2.3.9-RLC Reassembling	15.3.0
2019-03	RAN#83	R5-191403	0455	-	F	Correction to NR test case 8.1.3.1.1-Event A1 and A2	15.3.0
2019-03	RAN#83	R5-191405	0457	-	F	Correction to NR test case 8.2.3.11.2-ENDC measurement gap FR2	15.3.0
2019-03	RAN#83	R5-191415	0466	-	F	Addition of TC 8.1.3.2.3-inter-RAT measurement B2 RSRQ	15.3.0
2019-03	RAN#83	R5-191426	0475	-	F	Addition of NR test case 6.1.2.4-Cell Reselection for interband operation	15.3.0
2019-03	RAN#83	R5-191427	0476	-	F	Addition of NR test case 6.1.2.5-Cell Reselection for interband operation using Pcompensation Between FDD and TDD	15.3.0
2019-03	RAN#83	R5-191430	0479	-	F	Addition of NR test case 6.1.2.21-Cell reselection,Sintra SearchQ and SnonIntraSegrchQ	15.3.0
2019-03	RAN#83	R5-191431	0480	-	F	Addition of NR test case 6.1.2.22-Inter-frequency cell reselection with parameters ThreshX, HighQ, ThreshX, LowQ and ThreshServing, LowQ	15.3.0
2019-03	RAN#83	R5-191432	0481	-	F	Correction to NR test case 7.1.1.3.7-Power Headroom Reporting	15.3.0
2019-03	RAN#83	R5-191433	0482	-	F	Correction to NR test case 7.1.1.6.1-Correct handling of DL assignment Semi persistent	15.3.0
2019-03	RAN#83	R5-191434	0483	-	F	Addition of NR test case 8.1.1.1.2-Paging	15.3.0
2019-03	RAN#83	R5-191435	0484	-	F	Correction to NR test case 8.1.1.2.1-T300 expiry	15.3.0
2019-03	RAN#83	R5-191436	0485	-	F	Addition of NR test case 8.1.5.3.3-PWS notification	15.3.0
2019-03	RAN#83	R5-191445	0494	-	F	Correction to NR test case 9.1.5.1.1-Initial Registration	15.3.0
2019-03	RAN#83	R5-191447	0495	-	F	Addition of NR test case 8.1.3.1.5-Two event A3 RSRQ	15.3.0
2019-03	RAN#83	R5-191448	0496	-	F	Addition of NR test case 8.1.3.1.6_Two event A5 SINR	15.3.0
2019-03	RAN#83	R5-191449	0497	-	F	Correction to NR test case 8.1.5.3.1-ETWS	15.3.0
2019-03	RAN#83	R5-191509	0504	-	F	Addition of new RRC TC 8.1.5.3.2	15.3.0
2019-03	RAN#83	R5-191621	0514	-	F	Update of 5GS NR RRC test case 8.1.1.3.2	15.3.0
2019-03	RAN#83	R5-191641	0523	-	F	Updates to 5GS SA RRC TC - RRC / Paging for connection / Multiple paging records	15.3.0
2019-03	RAN#83	R5-191642	0524	-	F	Updates to 5GS SA RRC TC - RRC connection establishment / RRC Reject with wait time	15.3.0
2019-03	RAN#83	R5-191643	0525	-	F	Updates to 5GS SA RRC TC - SI change / Notification of BCCH modification / Short message for SI update	15.3.0
2019-03	RAN#83	R5-191651	0530	-	F	Update EN-DC RRC TC 8.2.2.4.1	15.3.0
2019-03	RAN#83	R5-191652	0531	-	F	Update EN-DC RRC TC 8.2.2.8.1	15.3.0
2019-03	RAN#83	R5-191653	0532	-	F	Update EN-DC RRC TC 8.2.2.9.1	15.3.0
2019-03	RAN#83	R5-191654	0533	-	F	Update EN-DC RRC TC 8.2.4.1.1.1	15.3.0
2019-03	RAN#83	R5-191656	0535	-	F	Update EN-DC RRC TC 8.2.5.3.1	15.3.0
2019-03	RAN#83	R5-191660	0539	-	F	Addition of 5GC TC- PDU session authentication and authorization / during the UE-requested PDU session procedure	15.3.0
2019-03	RAN#83	R5-191661	0540	-	F	Addition of Idle Mode TC - Steering of UE in roaming during registration/security check successful using List Type 1	15.3.0
2019-03	RAN#83	R5-191663	0542	-	F	Addition of Idle mode Test Case - PLMN selection of RPLMN, HPLMN/EHPLMN, UPLMN and OPLMN / Automatic mode	15.3.0
2019-03	RAN#83	R5-191733	0546	-	F	Update RRC TC 8.2.2.1.1 - SRB3 Establishment, Reconfiguration and Release / NR addition, modification and release / EN-DC	15.3.0
2019-03	RAN#83	R5-191764	0550	-	F	Addition of new TC 8.2.3.15	15.3.0
2019-03	RAN#83	R5-191804	0552	-	F	Title correction to MAC TC 7.1.1.7.1.1	15.3.0
2019-03	RAN#83	R5-191806	0553	-	F	Addition of new RRC TC 8.1.1.4.3	15.3.0
2019-03	RAN#83	R5-191810	0554	-	F	Addition of new 5GC TC 9.1.5.2.9	15.3.0
2019-03	RAN#83	R5-191823	0555	-	F	Addition of new 5GC TC 9.1.6.1.4	15.3.0

2019-03	RAN#83	R5-191827	0556	-	F	Addition of new RRC TC 8.1.1.4.2	15.3.0
2019-03	RAN#83	R5-191859	0559	-	F	Addition of new 5G-NR Idle Mode TC 6.1.1.6 - PLMN selection / Periodic reselection / MinimumPeriodicSearchTimer	15.3.0
2019-03	RAN#83	R5-191869	0561	-	F	Update to 5G-NR RRC Measurement configuration and reporting TC 8.2.3.3.1	15.3.0
2019-03	RAN#83	R5-191877	0562	-	F	Update to 5G-NR RRC Measurement configuration and reporting TC 8.2.3.4.1	15.3.0
2019-03	RAN#83	R5-191897	0570	-	F	Update to TC 8.2.5.4.1 SCG change failure / EN-DC	15.3.0
2019-03	RAN#83	R5-191898	0571	-	F	Editorial update to TC 7.1.3.2.1	15.3.0
2019-03	RAN#83	R5-191911	0574	-	F	Correction to MAC TBS test cases	15.3.0
2019-03	RAN#83	R5-191916	0577	-	F	Introduction of Non 3GPP Access over WLAN test cases	15.3.0
2019-03	RAN#83	R5-192203	0587	-	F	Update to 5G-NR RRC Measurement configuration and reporting TCs 8.2.3.x.x	15.3.0
2019-03	RAN#83	R5-192222	0589	-	F	Correction to NR RRC test case 8.2.3.5.1	15.3.0
2019-03	RAN#83	R5-192282	0429	1	F	Addition of new 5G-NR Idle Mode TC 6.1.2.19 - Speed-dependent cell reselection	15.3.0
2019-03	RAN#83	R5-192283	0440	1	F	Addition of NR test case 6.1.2.15-Cell reselection in shared network environment	15.3.0
2019-03	RAN#83	R5-192284	0441	1	F	Addition of NR test case 6.1.2.17-Cell reselection	15.3.0
2019-03	RAN#83	R5-192285	0541	1	F	Addition of Idle mode Test Case 6.1.2.7: Cell reselection / Equivalent PLMN	15.3.0
2019-03	RAN#83	R5-192286	0446	1	F	Correction to NR test case 7.1.1.5.4-CDRX	15.3.0
2019-03	RAN#83	R5-192287	0447	1	F	Correction to NR test case 7.1.1.6.2-Configured grant Type 1	15.3.0
2019-03	RAN#83	R5-192288	0448	1	F	Correction to NR test case 7.1.1.6.3-Configured grant Type 2	15.3.0
2019-03	RAN#83	R5-192289	0548	1	F	Addition of a new test purpose to TC 7.1.1.2.1 and TC 7.1.1.3.1 for a TDD-UL-DL-ConfigCommon including pattern2	15.3.0
2019-03	RAN#83	R5-192291	0575	1	F	Reduction of loops in MAC TBS test cases	15.3.0
2019-03	RAN#83	R5-192293	0565	1	F	Correction to 5GS RLC Test case 7.1.2.3.11	15.3.0
2019-03	RAN#83	R5-192296	0536	1	F	Correction to PDCP Test case 7.1.3.4.1 PDCP handover / Lossless handover / PDCP sequence number maintenance / PDCP status report to convey the information on missing or acknowledged PDCP SDUs at handover / In-order delivery and duplicate elimination in th	15.3.0
2019-03	RAN#83	R5-192297	0544	1	F	Correction to SDAP Test Cases	15.3.0
2019-03	RAN#83	R5-192298	0451	1	F	Addition of NR test case 8.1.1.3.4-RRCRelease with priority information of E-UTRA	15.3.0
2019-03	RAN#83	R5-192299	0526	1	F	Addition of 5GS SA RRC TC - RRC connection release / With priority information / T320 expiry	15.3.0
2019-03	RAN#83	R5-192300	0527	1	F	Addition of 5GS SA RRC TC - RRC connection release / With priority information / T320 expiry / E-UTRA	15.3.0
2019-03	RAN#83	R5-192301	0528	1	F	Addition of 5GS SA RRC TC - RRC resume / Suspend-Resume / Success	15.3.0
2019-03	RAN#83	R5-192302	0588	1	F	Addition of 5GS SA RRC TC - 8.1.2.1.1	15.3.0
2019-03	RAN#83	R5-192303	0590	1	F	Addition of 5GS SA RRC TC - 8.1.2.1.3	15.3.0
2019-03	RAN#83	R5-192304	0591	1	F	Addition of 5GS SA RRC TC - 8.1.5.3.4	15.3.0
2019-03	RAN#83	R5-192307	0557	1	F	Update ENDC TC 8.2.2.3.1	15.3.0
2019-03	RAN#83	R5-192308	0420	1	F	Update to 5G-NR RRC Measurement configuration and reporting TC 8.2.3.2.1	15.3.0
2019-03	RAN#83	R5-192329	0456	1	F	Correction to NR test case 8.2.3.11.1-ENDC measurement gap FR1	15.3.0
2019-03	RAN#83	R5-192330	0428	1	F	Correction to NR RRC test case 8.2.3.13.1	15.3.0
2019-03	RAN#83	R5-192331	0579	1	F	Correction to NR RRC test case 8.2.3.12.1	15.3.0
2019-03	RAN#83	R5-192332	0581	1	F	Correction to NR RRC test case 8.2.3.14.1	15.3.0
2019-03	RAN#83	R5-192333	0582	1	F	Correction to NR RRC test case 8.2.3.1.1	15.3.0
2019-03	RAN#83	R5-192334	0596	1	F	Correction to NR RRC test case 8.2.3.9.1 and 8.2.3.10.1	15.3.0
2019-03	RAN#83	R5-192339	0534	1	F	Update EN-DC RRC TC 8.2.5.1.1	15.3.0
2019-03	RAN#83	R5-192340	0506	1	F	Update to 5G testcase 9.1.5.1.14	15.3.0
2019-03	RAN#83	R5-192341	0572	1	F	Update to 5G TC 9.1.5.2.1 TA registration update	15.3.0
2019-03	RAN#83	R5-192342	0543	1	F	Correction to EN-DC NAS test case 10.2.1.1 - Default EPS bearer context activation	15.3.0
2019-03	RAN#83	R5-192343	0537	1	F	Addition of 5GC TC SMS over NAS service	15.3.0
2019-03	RAN#83	R5-192383	0459	1	F	Addition of NR test case 9.1.5.1.10-PLMN not allowed	15.3.0
2019-03	RAN#83	R5-192385	0498	1	F	Addition of new 5GC TC 9.1.7.1	15.3.0
2019-03	RAN#83	R5-192386	0502	1	F	Addition of new 5GC TC 9.1.5.1.11	15.3.0
2019-03	RAN#83	R5-192387	0503	1	F	Addition of new 5GC TC 9.1.5.1.12	15.3.0
2019-03	RAN#83	R5-192388	0507	1	F	Addition of 5G testcase 9.1.5.1.4	15.3.0
2019-03	RAN#83	R5-192389	0508	1	F	Addition of 5G testcase 9.1.3.1	15.3.0
2019-03	RAN#83	R5-192390	0538	1	F	Addition of 5GC TC - Initial registration / 5GS services / NSSAI handling	15.3.0
2019-03	RAN#83	R5-192391	0545	1	F	Addition of new 5GC TC 9.1.5.1.5	15.3.0
2019-03	RAN#83	R5-192392	0547	1	F	Introduction of TC 9.1.1.1 EAP based primary authentication and key agreement	15.3.0

2019-03	RAN#83	R5-192393	0549	1	F	Introduction of TC 9.1.1.3 EAP based primary authentication and key agreement	15.3.0
2019-03	RAN#83	R5-192394	0558	1	F	Addition of new 5GC TC 9.1.5.1.7	15.3.0
2019-03	RAN#83	R5-192396	0564	1	F	Addition of new 5GC TC 9.1.5.1.8	15.3.0
2019-03	RAN#83	R5-192397	0566	1	F	Update TC 9.1.6.1.1	15.3.0
2019-03	RAN#83	R5-192398	0573	1	F	Introduction of TC 9.1.5.2.4 Mobility registration update / The lower layer requests NAS signalling connection recovery	15.3.0
2019-03	RAN#83	R5-192399	0580	1	F	New 5GC test case 9.1.2.2	15.3.0
2019-03	RAN#83	R5-192700	0499	1	F	Addition of new 5GC TC 10.1.3.2	15.3.0
2019-03	RAN#83	R5-192701	0500	1	F	Addition of new 5GC TC 10.1.6.1	15.3.0
2019-03	RAN#83	R5-192702	0501	1	F	Addition of new 5GC TC 10.1.6.2	15.3.0
2019-03	RAN#83	R5-192703	0563	1	F	Addition of new 5GC TC 10.1.2.2	15.3.0
2019-03	RAN#83	R5-192749	0474	1	F	Addition of NR test case 6.1.2.2-Cell selection based on Qqualmin	15.3.0
2019-03	RAN#83	R5-192750	0432	1	F	Correcting test case 6.1.1.7	15.3.0
2019-03	RAN#83	R5-192751	0433	1	F	Updating test case 6.1.1.8	15.3.0
2019-03	RAN#83	R5-192754	0599	-	F	Addition of NR test case 6.1.2.1-Cell selection based on Qrxlevmin and Cell Reselection for Intra Frequency	15.3.0
2019-03	RAN#83	R5-192756	0600	-	F	Addition of NR test case 6.1.2.3-Cell selection-Serving cell bar	15.3.0
2019-03	RAN#83	R5-192757	0470	1	F	Addition of NR test case 6.1.1.2- PLMN selection of Other PLMN	15.3.0
2019-03	RAN#83	R5-192758	0471	1	F	Addition of NR test case 6.1.1.3-Cell reselection of ePLMN	15.3.0
2019-03	RAN#83	R5-192759	0473	1	F	Addition of NR test case 6.1.1.5-PLMN selection	15.3.0
2019-03	RAN#83	R5-192760	0477	1	F	Addition of NR test case 6.1.2.9-Cell Reselection using Qhyst, Qoffset and Treselection	15.3.0
2019-03	RAN#83	R5-192761	0478	1	F	Addition of NR test case 6.1.2.20-Inter-frequency cell reselection according to priority	15.3.0
2019-03	RAN#83	R5-192762	0509	1	F	Adding test case 6.2.1.2	15.3.0
2019-03	RAN#83	R5-192763	0510	1	F	Adding test case 6.2.1.1	15.3.0
2019-03	RAN#83	R5-192764	0511	1	F	Adding test case 6.2.1.3	15.3.0
2019-03	RAN#83	R5-192765	0512	1	F	Adding test case 6.2.1.4	15.3.0
2019-03	RAN#83	R5-192766	0513	1	F	Adding test case 6.2.1.5	15.3.0
2019-03	RAN#83	R5-192767	0592	1	F	Addition of Idle Mode test case 6.1.2.8	15.3.0
2019-03	RAN#83	R5-192768	0472	1	F	Addition of NR test case 6.1.1.4-PLMN selection in shared network environment	15.3.0
2019-03	RAN#83	R5-192769	0444	1	F	Correction to NR test case 7.1.1.1.3-SI request	15.3.0
2019-03	RAN#83	R5-192770	0585	1	F	Update to NR MAC Bandwidth Part operation TC 7.1.1.8.1	15.3.0
2019-03	RAN#83	R5-192771	0521	1	F	Correction to 5GS PDCP Test case 7.1.3.5.3 PDCP Data Recovery	15.3.0
2019-03	RAN#83	R5-192772	0450	1	F	Addition of NR test case 8.1.1.3.3-RRC connection release-Success-With priority information	15.3.0
2019-03	RAN#83	R5-192774	0453	1	F	Addition of NR test case 8.1.4.2.2.1-L2NR handover success	15.3.0
2019-03	RAN#83	R5-192776	0464	1	F	Addition of TC 8.1.3.2.1-Event B1 E-UTRA	15.3.0
2019-03	RAN#83	R5-192777	0465	1	F	Addition of TC 8.1.3.2.2-Event B2 E-UTRA	15.3.0
2019-03	RAN#83	R5-192782	0488	1	F	Addition of NR test case 8.1.3.1.11.1_intra-band Contiguous CA Event A6	15.3.0
2019-03	RAN#83	R5-192783	0489	1	F	Addition of NR test case 8.1.3.1.11.2_inter-band CA Event A6	15.3.0
2019-03	RAN#83	R5-192784	0490	1	F	Addition of NR test case 8.1.3.1.11.3_intra-band non Contiguous CA Event A6	15.3.0
2019-03	RAN#83	R5-192785	0491	1	F	Addition of NR test case 8.1.3.1.12.1_ Additional intra-band Contiguous CA	15.3.0
2019-03	RAN#83	R5-192786	0492	1	F	Addition of NR test case 8.1.3.1.12.2_ Additional inter-band CA	15.3.0
2019-03	RAN#83	R5-192787	0493	1	F	Addition of NR test case 8.1.3.1.12.3_ Additional intra-band non Contiguous CA	15.3.0
2019-03	RAN#83	R5-192794	0516	1	F	Addition of 5GS NR RRC test case 8.1.5.1.1	15.3.0
2019-03	RAN#83	R5-192795	0586	1	F	Addition of TC 8.1.4.2.1.1 Inter-RAT handover / From NR to E-UTRA	15.3.0
2019-03	RAN#83	R5-192796	0598	1	F	New RRC test case 8.1.5.2.2 SI change / Notification of BCCH modification / Short message for SI update in NR RRC_CONNECTED state	15.3.0
2019-03	RAN#83	R5-192798	0425	1	F	Update to EN-DC test case 8.2.3.7.1	15.3.0
2019-03	RAN#83	R5-192800	0435	1	F	Addition of 5GC test case 9.1.1.2	15.3.0
2019-03	RAN#83	R5-192801	0458	1	F	Addition of NR test case 9.1.1.6-Authentication abnormal	15.3.0
2019-03	RAN#83	R5-192802	0460	1	F	Addition of NR test case 9.1.6.1.2-T3521 timeout	15.3.0
2019-03	RAN#83	R5-192803	0461	1	F	Addition of NR test case 9.1.6.2.1-Network-initiated deregistration-deregistration for 3GPP access-reregistration required	15.3.0
2019-03	RAN#83	R5-192805	0463	1	F	Addition of NR test case 9.1.7.2-Service request for user data pending	15.3.0
2019-03	RAN#83	R5-192806	0568	1	F	Addition of new 5GC TC 9.1.5.2.2	15.3.0
2019-03	RAN#83	R5-192815	0567	1	F	Addition of new 5GC TC 9.1.2.1	15.3.0
2019-03	RAN#83	R5-192816	0569	1	F	Addition of 5GC Test case 10.1.5.1	15.3.0
2019-03	RAN#83	R5-192819	0576	2	F	Update of 5GS NR MAC test case 7.1.1.9.1	15.3.0
2019-03	RAN#83	R5-192824	0560	2	F	Addition of new 5GC TC 9.1.5.1.13	15.3.0
2019-03	RAN#83	R5-192829	0517	2	F	Update of 5GS NR RRC test case 8.2.1.1.1	15.3.0

2019-03	RAN#83	R5-192830	0595	2	F	Addition of 5GS PDCP TC 7.1.3.5.5	15.3.0
2019-03	RAN#83	R5-192838	0603	-	F	Addition of 5GS SA RRC TC - 8.1.3.1.13	15.3.0
2019-03	RAN#83	R5-192839	0604	-	F	Addition of 5GS SA RRC TC - 8.1.3.1.14	15.3.0
2019-03	RAN#83	R5-192852	0601	1	F	Addition of NR test case Event A4	15.3.0
2019-03	RAN#83	R5-192853	0602	1	F	Addition of NR test case Event A5	15.3.0
2019-03	RAN#83	R5-192854	0518	2	F	Update of 5GS NR RRC test case 8.2.3.6.1 and 8.2.3.8.1	15.3.0
2019-03	RAN#83	R5-192855	0462	2	F	Addition of NR test case 9.1.6.2.2-Reregistration not required	15.3.0
2019-03	RAN#83	-	-	-	-	Editorial update to align referenced to TS 38.508-1 table numbers	15.3.0
2019-06	RAN#84	R5-193861	0676	-	F	Correction to NR RLC test cases 7.1.2.2.3 and 7.1.2.2.4	15.4.0
2019-06	RAN#84	R5-193869	0677	-	F	Correction to 5GMM test case 9.1.5.2.4	15.4.0
2019-06	RAN#84	R5-193884	0681	-	F	Update of TC 9.1.5.1.13	15.4.0
2019-06	RAN#84	R5-193898	0687	-	F	Removal of TC 9.1.5.1.7	15.4.0
2019-06	RAN#84	R5-193984	0689	-	F	Clarification on DRB to use in MAC test cases	15.4.0
2019-06	RAN#84	R5-193986	0691	-	F	Clarification on DRB to use in RLC test cases	15.4.0
2019-06	RAN#84	R5-193987	0692	-	F	Correction to NR RLC test case 7.1.2.3.9	15.4.0
2019-06	RAN#84	R5-193988	0693	-	F	Clarification on DRB to use in PDCP test cases	15.4.0
2019-06	RAN#84	R5-194008	0698	-	F	Correction to EN-DC RRC test case 8.2.5.2.1	15.4.0
2019-06	RAN#84	R5-194031	0703	-	F	Correction to PDCP test case 7.1.3.5.1	15.4.0
2019-06	RAN#84	R5-194033	0705	-	F	Correction to 5GC NAS test case 9.1.8.1 - SMS over NAS / MO and MT SMS over NAS - Idle mode	15.4.0
2019-06	RAN#84	R5-194045	0713	-	F	Updates to 5GS SA RRC TC 8.1.1.4.1	15.4.0
2019-06	RAN#84	R5-194046	0714	-	F	Updates to 5GS SA RRC TC 8.1.5.2.1	15.4.0
2019-06	RAN#84	R5-194050	0718	-	F	Addition of 5GS SA RRC TC - Intra NR handover / Success / Security key reconfiguration	15.4.0
2019-06	RAN#84	R5-194051	0719	-	F	Addition of 5GS SA RRC TC - Intra NR handover / Failure / Security key reconfiguration	15.4.0
2019-06	RAN#84	R5-194119	0730	-	F	Correction to EN-DC RRC measurement test cases	15.4.0
2019-06	RAN#84	R5-194266	0735	-	F	Correction to EN-DC RRC test case 8.2.5.1.1	15.4.0
2019-06	RAN#84	R5-194288	0742	-	F	Correction to EN-DC RRC test case 8.2.5.3.1	15.4.0
2019-06	RAN#84	R5-194296	0745	-	F	Correction to RLC test case - AM RLC / RLC re-establishment procedure	15.4.0
2019-06	RAN#84	R5-194395	0751	-	F	Update of NR RRC TC 8.2.3.12.1	15.4.0
2019-06	RAN#84	R5-194396	0752	-	F	Addition of new RRC TC 8.1.5.6.5.1	15.4.0
2019-06	RAN#84	R5-194448	0759	-	F	Addition of new TC 9.1.5.1.6	15.4.0
2019-06	RAN#84	R5-194481	0764	-	F	Updates to 5GC NAS test case 9.1.2.2	15.4.0
2019-06	RAN#84	R5-194514	0776	-	F	Update of TC 9.1.5.2.4 Mobility registration update / The lower layer requests NAS signalling connection recovery	15.4.0
2019-06	RAN#84	R5-194637	0786	-	F	Update to TC 8.1.4.2.1.1	15.4.0
2019-06	RAN#84	R5-194696	0791	-	F	Correction to NR RLC test case 7.1.2.3.1	15.4.0
2019-06	RAN#84	R5-194699	0793	-	F	Correction to NR PDCP test case 7.1.3.5.2	15.4.0
2019-06	RAN#84	R5-194787	0795	-	F	Correction to NR test case 6.1.2.3-Cell selection-Serving cell bar	15.4.0
2019-06	RAN#84	R5-194788	0796	-	F	Correction to NR test case 6.1.2.9-Cell reselection using Qhyst, Qoffset and Treselection	15.4.0
2019-06	RAN#84	R5-194792	0797	-	F	Update to IDLE mode test case 6.1.1.1	15.4.0
2019-06	RAN#84	R5-194819	0727	1	F	Correction to MAC test cases	15.4.0
2019-06	RAN#84	R5-194822	0629	1	F	Correction to NR test case 7.1.1.1.3-SI request	15.4.0
2019-06	RAN#84	R5-194823	0611	1	F	Addition of NR test case 6.1.2.12-Cell reselection CellReservedForOtherUse	15.4.0
2019-06	RAN#84	R5-194833	0628	1	F	Correction to NR test case 6.1.2.1-Cell selection Qrxlevmin	15.4.0
2019-06	RAN#84	R5-194834	0746	1	F	Editorial Corrections to Test Cases 6.3.1.1, 6.1.1.1, 6.1.2.7, 7.1.1.1.3, 8.1.1.3.1, 8.1.1.3.5, 9.1.5.2.4	15.4.0
2019-06	RAN#84	R5-194835	0747	1	F	Corrections to Test Case 6.3.1.1	15.4.0
2019-06	RAN#84	R5-194836	0726	1	F	Correction to EN-DC RLC test cases 7.1.2.2.1, 7.1.2.2.2, 7.1.2.3.1 and 7.1.2.3.2	15.4.0
2019-06	RAN#84	R5-194837	0704	1	F	Correction to PDCP test case 7.1.3.5.4 - PDCP reordering / Maximum re-ordering delay below t-Reordering / t-Reordering timer operations	15.4.0
2019-06	RAN#84	R5-194838	0711	1	F	Updates to 5GS SA RRC TC 8.1.1.1.1	15.4.0
2019-06	RAN#84	R5-194839	0712	1	F	Updates to 5GS SA RRC TC 8.1.1.2.3	15.4.0
2019-06	RAN#84	R5-194840	0734	1	F	Correction of 5GC Test case 8.1.1.3.5	15.4.0
2019-06	RAN#84	R5-194841	0641	1	F	Correction of NR test case 8.1.3.1.5-Intra Freq Event A4	15.4.0
2019-06	RAN#84	R5-194842	0642	1	F	Correction of NR test case 8.1.3.1.8-Intra Freq Event A5	15.4.0
2019-06	RAN#84	R5-194843	0717	1	F	Removal of EN-DC RRC TC - BandwidthPart Configuration / SCG	15.4.0
2019-06	RAN#84	R5-194844	0770	1	F	Update of 5GS NR RRC test case 8.2.1.1.1	15.4.0
2019-06	RAN#84	R5-194845	0657	1	F	Correction to NR test case 8.2.3.11.1-ENDC measurement gap FR1	15.4.0
2019-06	RAN#84	R5-194846	0658	1	F	Correction to NR test case 8.2.3.11.2-ENDC measurement gap FR2	15.4.0
2019-06	RAN#84	R5-194847	0661	1	F	Corrections to 5G-NR RRC Measurement configuration and reporting test cases	15.4.0
2019-06	RAN#84	R5-194848	0673	1	F	Correction to EN-DC RRC test case 8.2.3.6.1	15.4.0
2019-06	RAN#84	R5-194849	0674	1	F	Correction to EN-DC RRC test case 8.2.3.7.1	15.4.0
2019-06	RAN#84	R5-194850	0675	1	F	Correction to EN-DC RRC test case 8.2.3.3.1	15.4.0



2019-06	RAN#84	R5-194851	0740	1	F	Correction to EN-DC RRC test case 8.2.3.8.1	15.4.0
2019-06	RAN#84	R5-194853	0741	1	F	Correction to EN-DC RRC test case 8.2.3.4.1 and 8.2.3.5.1	15.4.0
2019-06	RAN#84	R5-194854	0749	1	F	Update TC 8.2.3.15.1	15.4.0
2019-06	RAN#84	R5-194855	0755	1	F	Correction to EN-DC RRC measurement test cases 8.2.3.9.1 and 8.2.3.10.1 Editor's note: could not be implemented	15.4.0
2019-06	RAN#84	R5-194856	0665	1	F	Update of RRC TC 8.2.5.4.1	15.4.0
2019-06	RAN#84	R5-194857	0679	1	F	Correction to 5GMM test case 9.1.2.1	15.4.0
2019-06	RAN#84	R5-194858	0756	1	F	Correction to NR5GC testcase 9.1.3.1	15.4.0
2019-06	RAN#84	R5-194859	0659	1	F	Correction to NR test case 9.1.5.1.1-Registration Request	15.4.0
2019-06	RAN#84	R5-194867	0668	1	F	Update of TC 9.1.6.1.1	15.4.0
2019-06	RAN#84	R5-194868	0758	1	F	Correction to NR5GC testcase 9.1.5.1.14	15.4.0
2019-06	RAN#84	R5-194869	0609	1	F	Correction to 5GC TC 9.1.7.1	15.4.0
2019-06	RAN#84	R5-194871	0610	1	F	Correction to 5GC TC 10.1.3.2	15.4.0
2019-06	RAN#84	R5-194872	0680	1	F	Correction on 5GC TC 10.1.2.2	15.4.0
2019-06	RAN#84	R5-194873	0607	1	F	Correction to 5GC TC 10.1.6.1	15.4.0
2019-06	RAN#84	R5-194874	0608	1	F	Correction to 5GC TC 10.1.6.2	15.4.0
2019-06	RAN#84	R5-194890	0728	1	F	Introduction of Non 3GPP Access over WLAN test cases	15.4.0
2019-06	RAN#84	R5-195208	0765	1	F	Addition of new TC 9.1.5.1.9	15.4.0
2019-06	RAN#84	R5-195209	0707	1	F	Addition of 5GC NAS Test Case - Generic UE configuration update / New 5G-GUTI / NITZ / registration requested / Network slicing indication / New Allowed NSSAI / acknowledgement from the UE	15.4.0
2019-06	RAN#84	R5-195210	0708	1	F	Addition of 5GC NAS Test Case - UE-initiated de-registration / Abnormal / Change of cell into a new tracking area	15.4.0
2019-06	RAN#84	R5-195211	0757	1	F	Addition of NR5GC testcase 9.1.5.1.2	15.4.0
2019-06	RAN#84	R5-195212	0774	1	F	Introduction of TC 9.1.5.2.7 Mobility and periodic registration update / Rejected / UE identity cannot be derived by the network	15.4.0
2019-06	RAN#84	R5-195213	0775	1	F	Introduction of TC 9.1.5.2.8 Mobility and periodic registration update / Rejected / Implicitly de-registered	15.4.0
2019-06	RAN#84	R5-195226	0794	1	F	Addition of 5GSM test case 10.1.1.2	15.4.0
2019-06	RAN#84	R5-195228	0777	1	F	Introduction of TC 9.3.1.1 Mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / 5GC to EPC	15.4.0
2019-06	RAN#84	R5-195229	0778	1	F	Introduction of TC 9.3.1.2 Mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / EPC to 5GC	15.4.0
2019-06	RAN#84	R5-195230	0779	1	F	Introduction of TC 9.3.1.3 Mobility and periodic registration update / Rejected / Single-registration mode with N26 / Handling of EPS relevant parameters	15.4.0
2019-06	RAN#84	R5-195231	0682	1	F	New multilayer test case 11.1.3	15.4.0
2019-06	RAN#84	R5-195238	0780	1	F	Introduction of new TC 11.1.7 Emergency call setup from NR RRC_IDLE / Emergency Services Fallback to EPS with redirection / Single registration mode with N26 interface / Success	15.4.0
2019-06	RAN#84	R5-195243	0616	1	F	Addition of NR test case 6.2.3.3-Inter-RAT Cell reselection NR2L by priority Srxlev based	15.4.0
2019-06	RAN#84	R5-195244	0612	1	F	Addition of NR test case 6.1.2.13-Cell reselection CellReservedForOperatorUse with Access Identity 1-2-12-13-14	15.4.0
2019-06	RAN#84	R5-195245	0613	1	F	Addition of NR test case 6.1.2.14-Cell reselection CellReservedForOperatorUse with Access Identity 11-15	15.4.0
2019-06	RAN#84	R5-195247	0618	1	F	Addition of NR test case 6.2.3.5-Inter-RAT Cell reselection NR2L by priority from dedicated signalling	15.4.0
2019-06	RAN#84	R5-195249	0620	1	F	Addition of NR test case 6.2.3.7-Inter-RAT Cell reselection NR2L Snonintrasearch	15.4.0
2019-06	RAN#84	R5-195252	0623	1	F	Addition of NR test case 6.4.2.1-Cell selection Qrxlevmin and Cell reselection	15.4.0
2019-06	RAN#84	R5-195256	0627	1	F	Addition of NR test case 6.4.1.2-Cell reselection of ePLMN in manual mode	15.4.0
2019-06	RAN#84	R5-195257	0709	1	F	Addition of Idle Mode Test Case - Steering of UE in roaming during registration/security check successful but SOR Transparent container indicates ACK has been NOT been requested	15.4.0
2019-06	RAN#84	R5-195259	0631	1	F	Addition of NR test case 8.1.3.1.6-Inter Freq Event A4	15.4.0
2019-06	RAN#84	R5-195260	0632	1	F	Addition of NR test case 8.1.3.1.7-Inter Band Event A4	15.4.0
2019-06	RAN#84	R5-195261	0633	1	F	Addition of NR test case 8.1.3.1.9-Inter Freq Event A5	15.4.0
2019-06	RAN#84	R5-195262	0634	1	F	Addition of NR test case 8.1.3.1.10-Inter Band Event A5	15.4.0
2019-06	RAN#84	R5-195268	0640	1	F	Addition of NR test case 8.1.3.2.5-Event A2 and B2	15.4.0
2019-06	RAN#84	R5-195269	0643	1	F	Correction of NR test case 8.1.3.1.11-Two Event A3 RSRQ	15.4.0
2019-06	RAN#84	R5-195270	0644	1	F	Correction of NR test case 8.1.3.1.12-Two Event A5 SINR	15.4.0
2019-06	RAN#84	R5-195271	0645	1	F	Correction of NR test case 8.1.3.1.17.1-Intra Band Event A6	15.4.0
2019-06	RAN#84	R5-195272	0646	1	F	Correction of NR test case 8.1.3.1.17.2-Inter Band Event A6	15.4.0
2019-06	RAN#84	R5-195273	0647	1	F	Correction of NR test case 8.1.3.1.17.3-Intra Band non Contiguous Event A6	15.4.0
2019-06	RAN#84	R5-195274	0648	1	F	Correction of NR test case 8.1.3.1.18.1-Additional Reporting Intra	15.4.0

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2019-06	RAN#84	R5-195275	0649	1	F	Correction of NR test case 8.1.3.1.18.2-Additional Reporting Inter Band	15.4.0
2019-06	RAN#84	R5-195276	0650	1	F	Correction of NR test case 8.1.3.1.18.3-Additional Reporting Intra Band non Contiguous	15.4.0
2019-06	RAN#84	R5-195277	0782	1	F	Addition of 5GS NR RRC test case 8.1.3.1.2	15.4.0
2019-06	RAN#84	R5-195278	0783	1	F	Addition of 5GS NR RRC test case 8.1.3.1.3	15.4.0
2019-06	RAN#84	R5-195279	0784	1	F	Addition of 5GS NR RRC test case 8.1.3.1.4	15.4.0
2019-06	RAN#84	R5-195280	0790	1	F	Addition of 5GS NR RRC test case for Intra NR measurements / Blacklisting	15.4.0
2019-06	RAN#84	R5-195285	0699	1	F	New 5GS SA RRC TC 8.1.4.1.9.1	15.4.0
2019-06	RAN#84	R5-195286	0700	1	F	New 5GS SA RRC TC 8.1.4.1.9.2	15.4.0
2019-06	RAN#84	R5-195287	0701	1	F	New 5GS SA RRC TC 8.1.4.1.9.3	15.4.0
2019-06	RAN#84	R5-195288	0724	1	F	Addition of 5GS SA RRC TC - Intra NR handover / Failure / Re-establishment successful	15.4.0
2019-06	RAN#84	R5-195289	0725	1	F	Addition of 5GS SA RRC TC - Intra NR handover / Failure / Re-establishment failure	15.4.0
2019-06	RAN#84	R5-195290	0731	1	F	Addition of Intra-NR intra-frequency handover test case 8.1.4.1.1	15.4.0
2019-06	RAN#84	R5-195291	0732	1	F	Addition of Intra-NR inter-frequency handover test case 8.1.4.1.2	15.4.0
2019-06	RAN#84	R5-195292	0720	1	F	Addition of 5GS SA RRC TC - Redirection to NR / From E-UTRA / Success	15.4.0
2019-06	RAN#84	R5-195293	0736	1	F	New 5G Radio link failure test case 8.1.5.6.1	15.4.0
2019-06	RAN#84	R5-195294	0753	1	F	Addition of new RRC TC 8.1.5.6.5.2	15.4.0
2019-06	RAN#84	R5-195295	0754	1	F	Addition of new RRC TC 8.1.5.6.5.3 Editor's note: could not be implemented	15.4.0
2019-06	RAN#84	R5-195296	0768	1	F	Addition of 5GS NR RRC test case 8.1.5.4.1	15.4.0
2019-06	RAN#84	R5-195297	0771	1	F	New 5G Radio link failure test case 8.1.5.6.2	15.4.0
2019-06	RAN#84	R5-195298	0772	1	F	New 5G Radio link failure test case 8.1.5.6.3	15.4.0
2019-06	RAN#84	R5-195299	0773	1	F	New 5G Radio link failure test case 8.1.5.6.4	15.4.0
2019-06	RAN#84	R5-195300	0696	1	F	Correction to RRC test case 8.2.3.13.1	15.4.0
2019-06	RAN#84	R5-195301	0697	1	F	Correction to RRC test case 8.2.3.14.1	15.4.0
2019-06	RAN#84	R5-195302	0722	1	F	Addition of new EN-DC RRC TC - Measurement configuration control and reporting / Event A4 / Measurement of Neighbour NR cell / Inter-frequency measurements / EN-DC	15.4.0
2019-06	RAN#84	R5-195303	0723	1	F	Addition of new EN-DC RRC TC - Measurement configuration control and reporting / Event A4 / Measurement of Neighbour NR cell / Inter-band measurements / EN-DC	15.4.0
2019-06	RAN#84	R5-195336	0690	1	F	Correction to NR MAC test case 7.1.1.1.1	15.4.0
2019-06	RAN#84	R5-195338	0694	1	F	Correction to NR PDCP test case 7.1.3.4.1	15.4.0
2019-06	RAN#84	R5-195339	0715	1	F	Updates to PDCP Integrity Protection TCs 7.1.3.2.x	15.4.0
2019-06	RAN#84	R5-195340	0716	1	F	Updates to PDCP Ciphering and Deciphering TCs 7.1.3.3.x	15.4.0
2019-06	RAN#84	R5-195341	0662	1	F	Update of RRC TC 8.1.1.4.2	15.4.0
2019-06	RAN#84	R5-195342	0743	1	F	Correction to RRC test case 8.1.2.1.3	15.4.0
2019-06	RAN#84	R5-195343	0744	1	F	Correction to 5GS SA RRC TC - 8.1.2.1.1	15.4.0
2019-06	RAN#84	R5-195344	0669	1	F	Correction of NR test case 8.1.3.1.1-Intra Freq Event A1 A2	15.4.0
2019-06	RAN#84	R5-195345	0670	1	F	Correction of NR test case 8.1.3.2.1-Event B1	15.4.0
2019-06	RAN#84	R5-195346	0671	1	F	Correction of NR test case 8.1.3.2.2-Event B2	15.4.0
2019-06	RAN#84	R5-195347	0672	1	F	Correction of NR test case 8.1.3.2.3-Event B2 RSRQ	15.4.0
2019-06	RAN#84	R5-195350	0667	1	F	Update of 5GC TC 9.1.5.1.5	15.4.0
2019-06	RAN#84	R5-195351	0688	1	F	New multilayer test case 11.1.4	15.4.0
2019-06	RAN#84	R5-195352	0683	1	F	Addition of Multilayer test case 11.1.2	15.4.0
2019-06	RAN#84	R5-195353	0684	1	F	Addition of Multilayer test case 11.1.5	15.4.0
2019-06	RAN#84	R5-195354	0685	1	F	Addition of Multilayer test case 11.1.6	15.4.0
2019-06	RAN#84	R5-195355	0710	1	F	Addition of 5GS Multilayer Test Case 11.1.1 MO MMTEL voice call setup from NR RRC_IDLE / EPS Fallback with redirection / Single registration mode with N26 interface / Success	15.4.0
2019-06	RAN#84	R5-195358	0798	1	F	Update of EN-DC RRC TC 8.2.3.2.1	15.4.0
2019-06	RAN#84	R5-195363	0781	2	F	Update to NR MAC Bandwidth Part operation TC 7.1.1.8.1	15.4.0
2019-06	RAN#84	R5-195364	0695	2	F	Correction to NR PDCP test case 7.1.3.4.2	15.4.0
2019-06	RAN#84	R5-195365	0785	2	F	Addition of 5GS NR RRC test case 8.2.3.6.1a	15.4.0
2019-06	RAN#84	R5-195366	0787	2	F	Addition of 5GS NR RRC test case 8.2.3.6.1b	15.4.0
2019-06	RAN#84	R5-195367	0788	2	F	Addition of 5GS NR RRC test case 8.2.3.8.1a	15.4.0
2019-06	RAN#84	R5-195368	0789	2	F	Addition of 5GS NR RRC test case 8.2.3.8.1b	15.4.0
2019-06	RAN#84	R5-195369	0799	2	F	Correction to EN-DC RRC Measurement test cases for FR2 Power table	15.4.0
2019-06	RAN#84	R5-195370	0666	2	F	Update of 5GC TC 9.1.6.1.2	15.4.0
2019-06	RAN#84	-	-	-	-	Administrative release upgrade to match the release of 3GPP TS 38.508-1 which was upgraded at RAN#84 to Rel-16 due to Rel-16 relevant CR(s)	16.0.0
2019-09	RAN#85	R5-195649	0810	-	F	Addition of NR test case 6.4.1.1-HPLMN in Automatic PLMN Selection Mode in RRC_INACTIVE state	16.1.0

2019-09	RAN#85	R5-195650	0811	-	F	Addition of NR test case 6.4.2.2-Inter-Freq Cell reselection by priority of SIBs	16.1.0
2019-09	RAN#85	R5-195663	0824	-	F	Addition of NR test case 8.1.4.1.7.2-PCell Change and SCell addition Inter-band CA	16.1.0
2019-09	RAN#85	R5-195664	0825	-	F	Addition of NR test case 8.1.4.1.7.3-PCell Change and SCell addition Intra-band non-contiguous CA	16.1.0
2019-09	RAN#85	R5-195666	0827	-	F	Addition of NR test case 8.1.4.1.8.2-SCell no change Inter-band CA	16.1.0
2019-09	RAN#85	R5-195667	0828	-	F	Addition of NR test case 8.1.4.1.8.3-SCell no change Intra-band non-contiguous CA	16.1.0
2019-09	RAN#85	R5-195676	0837	-	F	Correction to NR test case 8.1.5.3.1-PWS reception in NR RRC_IDLE state	16.1.0
2019-09	RAN#85	R5-195677	0838	-	F	Correction to NR test case 8.1.5.3.3-PWS reception in NR RRC_CONNECTED state	16.1.0
2019-09	RAN#85	R5-195681	0842	-	F	Correction to NR test case 9.1.5.1.10-PLMN not allowed	16.1.0
2019-09	RAN#85	R5-195712	0850	-	F	Update to RRC measurement test cases in EN-DC for FR2 support	16.1.0
2019-09	RAN#85	R5-195929	0863	-	F	Update to PDCP test cases in EN-DC for FR2 support	16.1.0
2019-09	RAN#85	R5-195947	0870	-	F	Correction to references to test procedure for Switch off / Power off UE	16.1.0
2019-09	RAN#85	R5-195948	0871	-	F	Correction of power level units for test case 7.1.1.7.1	16.1.0
2019-09	RAN#85	R5-195949	0872	-	F	Correction of power level units for test cases 8.1.3.1.11, 8.1.3.1.12, 8.1.3.1.15A, 8.1.3.2.3	16.1.0
2019-09	RAN#85	R5-195981	0876	-	F	Correction to 5GC TC 10.1.6.1	16.1.0
2019-09	RAN#85	R5-195996	0878	-	F	Update PDCP test case 7.1.3.2.1	16.1.0
2019-09	RAN#85	R5-195997	0879	-	F	Update PDCP test case 7.1.3.3.1	16.1.0
2019-09	RAN#85	R5-196002	0884	-	F	Update RRC measurement test case 8.2.3.14	16.1.0
2019-09	RAN#85	R5-196039	0889	-	F	Addition of new 5GC TC 10.1.2.1	16.1.0
2019-09	RAN#85	R5-196046	0895	-	F	Correction to 5GC TC 8.1.5.1.1	16.1.0
2019-09	RAN#85	R5-196055	0902	-	F	Correction to TC 9.1.7.1-Service Request in Idle state	16.1.0
2019-09	RAN#85	R5-196093	0919	-	F	Correction to RLC test case 7.1.2.3.11	16.1.0
2019-09	RAN#85	R5-196109	0930	-	F	To void TC 8.1.1.3.5	16.1.0
2019-09	RAN#85	R5-196110	0931	-	F	To void TC 8.1.1.3.6	16.1.0
2019-09	RAN#85	R5-196111	0932	-	F	To void TC 8.1.1.4.3	16.1.0
2019-09	RAN#85	R5-196112	0933	-	F	To void TC 8.1.4.1.3	16.1.0
2019-09	RAN#85	R5-196113	0934	-	F	To void TC 8.1.4.1.4	16.1.0
2019-09	RAN#85	R5-196114	0935	-	F	Correction to EN-DC RRC TCs 8.2.2.4.1 & 8.2.2.5.1	16.1.0
2019-09	RAN#85	R5-196118	0939	-	F	Updates to EN-DC RRC TC 8.2.3.7.1a	16.1.0
2019-09	RAN#85	R5-196119	0940	-	F	Updates to EN-DC RRC TC 8.2.3.7.1b	16.1.0
2019-09	RAN#85	R5-196156	0947	-	F	Correction to NR Idle test case 6.1.1.6	16.1.0
2019-09	RAN#85	R5-196217	0954	-	F	Update of NR test case 6.1.2.2-Intra-NR Cell Selection Qqualmin based	16.1.0
2019-09	RAN#85	R5-196218	0955	-	F	Update of NR test case 6.1.2.21-Cell reselection, SIntraSearchQ and SnonIntraSeqrchQ	16.1.0
2019-09	RAN#85	R5-196261	0962	-	F	Correction to NR test case 7.1.3.4.1 - PDCP Lossless handover	16.1.0
2019-09	RAN#85	R5-196285	0964	-	F	Correction to EN-DC RRC test case 8.2.5.3.1	16.1.0
2019-09	RAN#85	R5-196306	0969	-	F	Removal of NR RRC test case 8.1.2.1.3	16.1.0
2019-09	RAN#85	R5-196353	0971	-	F	Correction to test cases 6.1.1.8	16.1.0
2019-09	RAN#85	R5-196354	0972	-	F	Update sub-clause 6.2.1 test cases with the latest generic procedure references	16.1.0
2019-09	RAN#85	R5-196355	0973	-	F	Update to test case 9.1.5.1.5	16.1.0
2019-09	RAN#85	R5-196489	0976	-	F	Update of RRC TC 8.1.5.6.5.2	16.1.0
2019-09	RAN#85	R5-196492	0977	-	F	New RRC TC 8.1.5.6.5.3	16.1.0
2019-09	RAN#85	R5-196598	0982	-	F	Correction to Idle TC 6.1.1.3	16.1.0
2019-09	RAN#85	R5-196610	0985	-	F	Correction to Idle TC 6.1.2.8	16.1.0
2019-09	RAN#85	R5-196614	0988	-	F	Deletion of TC 8.1.4.1.1	16.1.0
2019-09	RAN#85	R5-196624	0991	-	F	Correction to RLC TC 7.1.2.2.5 and 7.1.2.2.6	16.1.0
2019-09	RAN#85	R5-196633	0995	-	F	Correction to 5GC TC 9.1.6.1.4	16.1.0
2019-09	RAN#85	R5-196642	0996	-	F	Adding specs to TS 38.523-1 References section	16.1.0
2019-09	RAN#85	R5-196730	1009	-	F	Update of test case 9.3.1.1 Mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / 5GC to EPC	16.1.0
2019-09	RAN#85	R5-196731	1010	-	F	Update of test case 9.3.1.2 Mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / EPC to 5GC	16.1.0
2019-09	RAN#85	R5-196732	1011	-	F	Update of test case 9.3.1.3 Mobility and periodic registration update / Rejected / Single-registration mode with N26 / Handling of EPC relevant parameters	16.1.0
2019-09	RAN#85	R5-196745	1013	-	F	Correction to pre-condition of MAC test cases	16.1.0
2019-09	RAN#85	R5-196753	1019	-	F	Correction to ENDC test case 7.1.2.2.6	16.1.0
2019-09	RAN#85	R5-196755	1020	-	F	Correction to NR5GC test case 9.1.5.2.8	16.1.0
2019-09	RAN#85	R5-196779	1029	-	F	Update to TC 8.1.3.1.15A	16.1.0
2019-09	RAN#85	R5-196827	1031	-	F	Removal of Radio Link Failure test cases	16.1.0
2019-09	RAN#85	R5-196828	1032	-	F	Editorial changes to SERVICE REQUEST parameters for multi layer	16.1.0



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2019-09	RAN#85	R5-196835	1036	-	F	Update to 5GS NR RRC test case 8.1.5.4.1	16.1.0
2019-09	RAN#85	R5-197001	0941	1	F	Correction of NR test case 7.1.1.3.3	16.1.0
2019-09	RAN#85	R5-197002	0943	1	F	Correction to test case 7.1.1.3.4	16.1.0
2019-09	RAN#85	R5-197003	0944	1	F	Correction to test case 7.1.1.3.5	16.1.0
2019-09	RAN#85	R5-197005	0905	1	F	Correction to test case 8.1.1.4.2	16.1.0
2019-09	RAN#85	R5-197006	0914	1	F	Correction to ENDC test case 10.2.2.1	16.1.0
2019-09	RAN#85	R5-197007	0983	1	F	Correction to RLC AM test case 7.1.2.3.9	16.1.0
2019-09	RAN#85	R5-197008	0953	1	F	Correction to RLC test case 7.1.2.3.10 in EN-DC	16.1.0
2019-09	RAN#85	R5-197011	1026	1	F	Correction to ENDC test case 7.1.2.3.5	16.1.0
2019-09	RAN#85	R5-197012	0918	1	F	Correction to PDCP test case 7.1.3.2.1	16.1.0
2019-09	RAN#85	R5-197013	1002	1	F	Correction to NR PDCP test case 7.1.3.4.2	16.1.0
2019-09	RAN#85	R5-197015	0904	1	F	Updates to EN-DC RRC measurement test case 8.2.3.3.1	16.1.0
2019-09	RAN#85	R5-197016	1012	1	F	Correction to EN-DC RRC test case 8.2.3.4.1 and 8.2.3.7.1	16.1.0
2019-09	RAN#85	R5-197017	0865	1	F	Update to NR RRC Idle mode test cases for FR2 support	16.1.0
2019-09	RAN#85	R5-197018	0864	1	F	Update to CA test cases in EN-DC for FR2 support	16.1.0
2019-09	RAN#85	R5-197019	0897	1	F	Correction to NR test case 6.1.2.1-cell selection	16.1.0
2019-09	RAN#85	R5-197020	0898	1	F	Correction to NR test case 6.1.2.13-Cell reselection CellReservedForOperatorUse with Access Identity 0-1-2-12-13-14	16.1.0
2019-09	RAN#85	R5-197021	0814	1	F	Correction to NR test case 7.1.1.1.4-BeamFailure	16.1.0
2019-09	RAN#85	R5-197022	0899	1	F	Correction to TC 7.1.1.3.5-Padding BSR	16.1.0
2019-09	RAN#85	R5-197023	0961	1	F	Correction to NR test case 7.1.1.9.1 - MAC Reset	16.1.0
2019-09	RAN#85	R5-197026	0978	1	F	Correction to Several MAC test cases	16.1.0
2019-09	RAN#85	R5-197027	0990	1	F	Correction to MAC TC 7.1.1.1.3	16.1.0
2019-09	RAN#85	R5-197029	0911	1	F	Correction to 5GS RLC test case 7.1.2.3.6	16.1.0
2019-09	RAN#85	R5-197030	0974	1	F	Correction to RLC test case 7.1.2.3.7	16.1.0
2019-09	RAN#85	R5-197051	0949	1	F	Updates to 5GS PDCP test cases 7.1.3.1.1 and 7.1.3.1.2	16.1.0
2019-09	RAN#85	R5-197052	0901	1	F	Correction to TC 8.1.1.3.4-NR2L reselection by RRCRelease	16.1.0
2019-09	RAN#85	R5-197053	0927	1	F	Updates to 5GS SA RRC TC 8.1.1.4.1	16.1.0
2019-09	RAN#85	R5-197054	0956	1	F	Correction to TC 8.1.1.2.1-T300 expiry	16.1.0
2019-09	RAN#85	R5-197055	0957	1	F	Correction to TC 8.1.1.3.3-T320 expiry	16.1.0
2019-09	RAN#85	R5-197057	0968	1	F	Correction to NR RRC Test case 8.1.2.1.1	16.1.0
2019-09	RAN#85	R5-197058	0832	1	F	Correction to NR test case 8.1.3.1.11-two RSRQ A3	16.1.0
2019-09	RAN#85	R5-197059	0833	1	F	Correction to NR test case 8.1.3.1.12-two SINR A5	16.1.0
2019-09	RAN#85	R5-197060	0834	1	F	Correction to NR test case 8.1.3.1.17.3-A6 intraband non contiguous	16.1.0
2019-09	RAN#85	R5-197061	0835	1	F	Correction to NR test case 8.1.3.1.18.3-A6 intraband non contiguous additional reporting	16.1.0
2019-09	RAN#85	R5-197062	0836	1	F	Correction to NR test case 8.1.3.2.5-A2 and B2	16.1.0
2019-09	RAN#85	R5-197063	0861	1	F	Editorial update MeasurementReport table	16.1.0
2019-09	RAN#85	R5-197064	1028	1	F	Correction to RRC TC 8.1.3.1.11, 8.1.3.1.12, 8.1.3.2.3 and 8.1.4.1.9.1	16.1.0
2019-09	RAN#85	R5-197065	0928	1	F	Updates to 5GS SA RRC TC 8.1.5.2.1	16.1.0
2019-09	RAN#85	R5-197066	0929	1	F	Updates to 5GS SA RRC TC 8.1.5.5.1	16.1.0
2019-09	RAN#85	R5-197067	1033	1	F	Updates to RLF test case 8.1.5.6.1	16.1.0
2019-09	RAN#85	R5-197068	1034	1	F	Updates to RLF test case 8.1.5.6.3	16.1.0
2019-09	RAN#85	R5-197070	1001	1	F	Correction to EN-DC RRC test case 8.2.1.1.1	16.1.0
2019-09	RAN#85	R5-197071	1003	1	F	Correction to EN-DC RRC test case 8.2.2.7.1	16.1.0
2019-09	RAN#85	R5-197072	0839	1	F	Correction to NR test case 8.2.3.15.1-A2 and A3	16.1.0
2019-09	RAN#85	R5-197073	0873	1	F	Correction to EN-DC RRC measurement test case 8.2.3.9.1	16.1.0
2019-09	RAN#85	R5-197074	1030	1	F	Correction to EN-DC RRC measurement test case 8.2.3.10.1	16.1.0
2019-09	RAN#85	R5-197075	0948	1	F	Correction to EN-DC RRC test case 8.2.4.3.1.1	16.1.0
2019-09	RAN#85	R5-197076	1035	1	F	Updates to test cases using SERVICE REQUEST procedure	16.1.0
2019-09	RAN#85	R5-197077	0840	1	F	Correction to NR test case 9.1.1.6-5G AKA authentication abnormal	16.1.0
2019-09	RAN#85	R5-197078	0993	1	F	Correction to 5GC TC 9.1.2.2	16.1.0
2019-09	RAN#85	R5-197079	0841	1	F	Correction to NR test case 9.1.5.1.1-Initial registration	16.1.0
2019-09	RAN#85	R5-197080	0843	1	F	Correction to NR test case 9.1.5.2.4-Mobility registration update by lower layer failure	16.1.0
2019-09	RAN#85	R5-197081	0896	1	F	Correction to 5GC TC 9.1.5.1.9	16.1.0
2019-09	RAN#85	R5-197082	0920	1	F	Correction to 5GC NAS test case 9.1.6.1.3	16.1.0
2019-09	RAN#85	R5-197083	0945	1	F	Update of 5GC TC 9.1.5.1.11	16.1.0
2019-09	RAN#85	R5-197084	0946	1	F	Update of 5GC TC 9.1.5.1.12	16.1.0
2019-09	RAN#85	R5-197085	0965	1	F	Correction to NR5GC testcase 9.1.5.1.2	16.1.0
2019-09	RAN#85	R5-197086	0966	1	F	Correction to NR5GC testcase 9.1.5.1.14	16.1.0
2019-09	RAN#85	R5-197087	0981	1	F	Correction to 5GC test case 9.1.6.1.1 De-registration	16.1.0
2019-09	RAN#85	R5-197088	0844	1	F	Correction to NR test case 9.1.7.2-Data pending without user-plane resource	16.1.0
2019-09	RAN#85	R5-197089	0924	1	F	Corrections to 5GS Multilayer Test Case 11.1.1	16.1.0
2019-09	RAN#85	R5-197090	0975	1	F	Correction to 5GS\EPS Fallback test case 11.1.3	16.1.0
2019-09	RAN#85	R5-197091	0997	1	F	Update of 5GS\EPS Fallback test cases for System information, type of cells and more	16.1.0
2019-09	RAN#85	R5-197092	1007	1	F	Correction to 5GS\EPS Fallback test case 11.1.4	16.1.0
2019-09	RAN#85	R5-197093	1015	1	F	Update multi-layer test case 11.1.2	16.1.0

2019-09	RAN#85	R5-197094	1016	1	F	Update multi-layer test case 11.1.5	16.1.0
2019-09	RAN#85	R5-197095	1017	1	F	Update multi-layer test case 11.1.6	16.1.0
2019-09	RAN#85	R5-197097	1039	-	F	Correction to NR test case 8.1.5.3.4-PWS reception using dedicatedSystemInformationDelivery	16.1.0
2019-09	RAN#85	R5-197185	0804	1	F	Addition of NR test case 6.2.3.1-Inter-RAT Cell reselection L2NR by priority Srxlev based	16.1.0
2019-09	RAN#85	R5-197186	0805	1	F	Addition of NR test case 6.2.3.2-Inter-RAT Cell reselection L2NR by priority Squal based	16.1.0
2019-09	RAN#85	R5-197187	0806	1	F	Addition of NR test case 6.2.3.4-Inter-RAT Cell reselection NR2L by priority Squal based	16.1.0
2019-09	RAN#85	R5-197188	0807	1	F	Addition of NR test case 6.2.3.6-Inter-RAT Cell reselection L2NR by priority from dedicated signalling	16.1.0
2019-09	RAN#85	R5-197189	0808	1	F	Addition of NR test case 6.2.3.8-Inter-RAT Cell reselection L2NR Snonintrasearch	16.1.0
2019-09	RAN#85	R5-197190	0809	1	F	Addition of NR test case 6.2.3.9-Inter-RAT Cell reselection NR2L Speed Dependent	16.1.0
2019-09	RAN#85	R5-197191	0812	1	F	Addition of NR test case 6.4.3.1-Inter-RAT Cell reselection NR2L Srxlev based	16.1.0
2019-09	RAN#85	R5-197192	1043	-	F	Correction to UE capability transfer test case 8.1.5.1.1	16.1.0
2019-09	RAN#85	R5-197193	0813	1	F	Update of NR test case 6.1.2.22-Inter-frequency cell reselection with parameters	16.1.0
2019-09	RAN#85	R5-197195	0846	1	F	Addition of test case 6.3.1.3 of TS 38.523-1	16.1.0
2019-09	RAN#85	R5-197196	0847	1	F	Addition of test case 6.3.1.4 of TS 38.523-1	16.1.0
2019-09	RAN#85	R5-197197	0848	1	F	Addition of test case 6.3.1.8 of TS 38.523-1	16.1.0
2019-09	RAN#85	R5-197198	0849	1	F	Addition of test case 6.3.1.9 of TS 38.523-1	16.1.0
2019-09	RAN#85	R5-197199	0893	1	F	Addition of NR Idle test case 6.1.2.23 - Cell reselection/ MFBI	16.1.0
2019-09	RAN#85	R5-197201	1014	1	F	Update of 5GC test case 9.1.1.2	16.1.0
2019-09	RAN#85	R5-197202	1038	1	F	Addition of new NR MAC test case 7.1.1.3.2b	16.1.0
2019-09	RAN#85	R5-197203	0923	1	F	Addition of Idle Mode Test Case -Cell reselection, Sintrasearch, Snonintrasearch	16.1.0
2019-09	RAN#85	R5-197205	0866	1	F	Add RRC reconfiguration test case 8.1.2.1.4	16.1.0
2019-09	RAN#85	R5-197206	0867	1	F	Add RRC reconfiguration test case 8.1.2.1.5.1	16.1.0
2019-09	RAN#85	R5-197207	0868	1	F	Add RRC reconfiguration test case 8.1.2.1.5.2	16.1.0
2019-09	RAN#85	R5-197208	0869	1	F	Add RRC reconfiguration test case 8.1.2.1.5.3	16.1.0
2019-09	RAN#85	R5-197209	0817	1	F	Addition of NR test case 8.1.3.1.16-whitelisting	16.1.0
2019-09	RAN#85	R5-197210	0818	1	F	Addition of NR test case 8.1.3.1.20-GapFR1	16.1.0
2019-09	RAN#85	R5-197211	0819	1	F	Addition of NR test case 8.1.3.1.21-GapFR2	16.1.0
2019-09	RAN#85	R5-197213	0822	1	F	Addition of NR test case 8.1.3.2.4-Event B2 SINR	16.1.0
2019-09	RAN#85	R5-197214	0984	1	F	Addition of SA NR measurement test case TC 8.1.3.1.23	16.1.0
2019-09	RAN#85	R5-197215	0823	1	F	Addition of NR test case 8.1.4.1.7.1-PCell Change and SCell addition Intra-band Contiguous CA	16.1.0
2019-09	RAN#85	R5-197216	0826	1	F	Addition of NR test case 8.1.4.1.8.1-SCell no change Intra-band Contiguous CA	16.1.0
2019-09	RAN#85	R5-197217	0894	1	F	Addition of 5GC test case 9.1.1.4	16.1.0
2019-09	RAN#85	R5-197218	0887	1	F	Addition of new 5GC TC 10.1.3.1	16.1.0
2019-09	RAN#85	R5-197219	0998	1	F	Introduction of new TC 11.4.1 5GMM-REGISTERED.NORMAL-SERVICE / 5GMM-IDLE / Emergency call / Utilising emergency number stored on the USIM / New emergency PDU session	16.1.0
2019-09	RAN#85	R5-197220	0999	1	F	Introduction of new TC 11.4.2 5GMM-DEREGISTERED.LIMITED-SERVICE / Emergency call / Handling of forbidden PLMNs	16.1.0
2019-09	RAN#85	R5-197221	1000	1	F	Introduction of new TC 11.4.3 5GMM-DEREGISTERED.NO-SUPI / Emergency call / Utilisation of emergency numbers stored on the ME / Initial registration for emergency services	16.1.0
2019-09	RAN#85	R5-197227	0979	1	F	Non 3GPP Access over WLAN test cases	16.1.0
2019-09	RAN#85	R5-197247	0877	1	F	Update MAC test case 7.1.1.1	16.1.0
2019-09	RAN#85	R5-197250	0989	1	F	Correction to RLC UM test case 7.1.2.2.5	16.1.0
2019-09	RAN#85	R5-197255	0938	1	F	Correction to PDCP TC 7.1.3.5.3	16.1.0
2019-09	RAN#85	R5-197256	0986	1	F	Corrections to TC 8.1.4.1.2	16.1.0
2019-09	RAN#85	R5-197258	1023	1	F	Correction to test cases 8.1.1.2.3	16.1.0
2019-09	RAN#85	R5-197259	0917	1	F	Correction to test case 10.1.5.1	16.1.0
2019-09	RAN#85	R5-197260	0880	1	F	Update PDCP test case 7.1.3.4.1	16.1.0
2019-09	RAN#85	R5-197263	0915	2	F	Correction to NR test case 7.1.1.2.1	16.1.0
2019-09	RAN#85	R5-197264	0916	2	F	Correction to NR test case 7.1.1.3.1	16.1.0
2019-09	RAN#85	R5-197266	1027	1	F	Correction to test case 7.1.2.3.8	16.1.0
2019-09	RAN#85	R5-197267	0922	1	F	Initial registration / 5GS services / NSSAI handling / NSSAI Storage	16.1.0
2019-09	RAN#85	R5-197292	1044	-	F	Update of 5GC test case 9.1.1.1	16.1.0
2019-09	RAN#85	R5-197297	1045	-	F	Update of 5GC test case 9.1.1.3	16.1.0
2019-09	RAN#85	R5-197299	1005	2	F	Correction to NR MAC test case 7.1.1.3.2	16.1.0
2019-09	RAN#85	R5-197661	1037	1	F	Update to NR MAC Bandwidth Part operation TC 7.1.1.8.1	16.1.0
2019-09	RAN#85	R5-197662	1042	1	F	Corrections to NR MAC test case 7.1.1.1.1a	16.1.0

2019-09	RAN#85	R5-197663	0900	2	F	Correction to TC 7.1.2.3.4-18 bit SN processing	16.1.0
2019-09	RAN#85	R5-197664	1022	3	F	Correction to ENDC test case 7.1.2.3.3	16.1.0
2019-09	RAN#85	R5-197665	1041	1	F	Correction to EN-DC RRC Test case 8.2.3.13.1	16.1.0
2019-09	RAN#85	R5-197666	1040	1	F	Correction to NR test case 9.1.3.1-Identification procedure	16.1.0
2019-12	RAN#86	R5-197740	1046	-	F	Update RRC reconfiguration test case 8.1.2.1.4	16.2.0
2019-12	RAN#86	R5-197741	1047	-	F	Update RRC reconfiguration test case 8.1.2.1.5.1	16.2.0
2019-12	RAN#86	R5-197744	1049	-	F	Update RRC reconfiguration test case 8.1.3.1.18.1	16.2.0
2019-12	RAN#86	R5-197745	1050	-	F	Update RRC reconfiguration test case 8.1.5.6.5.1	16.2.0
2019-12	RAN#86	R5-197838	1054	-	F	Update of TC 6.4.1.1-HPLMN in Automatic PLMN Selection Mode	16.2.0
2019-12	RAN#86	R5-197839	1055	-	F	Correction to NR test case 6.1.2.14-Cell reselection CellReservedForOperatorUse with Access Identity 11 or 15	16.2.0
2019-12	RAN#86	R5-197840	1056	-	F	Correction of NR test case 6.2.3.2-Inter-RAT cell reselection from L2NR	16.2.0
2019-12	RAN#86	R5-197841	1057	-	F	Correction of NR test case 6.2.3.4-Inter-RAT cell reselection from NR2L	16.2.0
2019-12	RAN#86	R5-197842	1058	-	F	Correction of NR test case 6.2.3.5-Inter-RAT cell reselection from N2L by dedicated signalling	16.2.0
2019-12	RAN#86	R5-197843	1059	-	F	Correction of NR test case 6.2.3.6-Inter-RAT cell reselection from L2N by dedicated signalling	16.2.0
2019-12	RAN#86	R5-197849	1065	-	F	Correction to NR test case 7.1.2.3.5-Control of receive window for AM RLC	16.2.0
2019-12	RAN#86	R5-197854	1070	-	F	Correction of NR test case 8.1.3.1.2 - Event A3 intra-Freq	16.2.0
2019-12	RAN#86	R5-197856	1072	-	F	Correction to NR TC 8.1.3.1.8-Event A5 Intra-Freq	16.2.0
2019-12	RAN#86	R5-197860	1076	-	F	Correction to NR test case 8.1.5.3.1-PWS reception in NR RRC_IDLE state	16.2.0
2019-12	RAN#86	R5-197867	1083	-	F	Correction to NR test case 9.1.6.2.2-Re-registration not required	16.2.0
2019-12	RAN#86	R5-197904	1089	-	F	Correction to NR MAC test case 7.1.1.3.5 to accommodate the DCI format change to DCI_0_1	16.2.0
2019-12	RAN#86	R5-198006	1099	-	F	Addition of new 5GC test case 9.1.2.3	16.2.0
2019-12	RAN#86	R5-198085	1110	-	F	Update of References in 38.523-1	16.2.0
2019-12	RAN#86	R5-198086	1111	-	F	Introduction of new TC 9.1.5.2.6 Mobility registration update / Registered slice(s) change	16.2.0
2019-12	RAN#86	R5-198147	1127	-	F	Updates to 5GMM test case 9.1.4.1 for NAS cells definition in pre- test conditions	16.2.0
2019-12	RAN#86	R5-198148	1128	-	F	Updates to 5GMM initial registration test cases for NAS cells definition in pre-test conditions	16.2.0
2019-12	RAN#86	R5-198180	1130	-	F	Correction to PDCP Test Case 7.1.3.5.3	16.2.0
2019-12	RAN#86	R5-198181	1131	-	F	Correction to EN-DC Inter-RAT Measurement Test Cases 8.2.3.1.1, 8.2.3.2.1, 8.2.3.3.1, 8.2.3.12.1	16.2.0
2019-12	RAN#86	R5-198184	1134	-	F	Corrections to 5GC NAS Test Case 10.1.1.1	16.2.0
2019-12	RAN#86	R5-198185	1135	-	F	Corrections to 5GC NAS Test Case 9.1.6.1.3	16.2.0
2019-12	RAN#86	R5-198186	1136	-	F	Corrections to 5GC NAS Test Case 9.1.4.1	16.2.0
2019-12	RAN#86	R5-198187	1137	-	F	Correction to RLC Test Case 7.1.2.3.5	16.2.0
2019-12	RAN#86	R5-198188	1138	-	F	Correction to RLC Test Case 7.1.2.3.11	16.2.0
2019-12	RAN#86	R5-198189	1139	-	F	Correction to 5GC NAS NSSAI Test Case 9.1.5.1.3a	16.2.0
2019-12	RAN#86	R5-198216	1149	-	F	Correction to TC 7.1.1.1.2	16.2.0
2019-12	RAN#86	R5-198235	1151	-	F	Correction to 5GC test case 9.1.1.1	16.2.0
2019-12	RAN#86	R5-198242	1153	-	F	Correction to 5GC test case 9.1.1.2	16.2.0
2019-12	RAN#86	R5-198299	1164	-	F	Correction to NR TC 9.1.5.1.9	16.2.0
2019-12	RAN#86	R5-198322	1166	-	F	Corrections to 5GC test case 10.1.1.2	16.2.0
2019-12	RAN#86	R5-198323	1167	-	F	Correction to NR MAC test case 7.1.1.1.2	16.2.0
2019-12	RAN#86	R5-198325	1168	-	F	Correction to 5GC test case 9.1.5.1.6	16.2.0
2019-12	RAN#86	R5-198331	1169	-	F	Correction to NR MAC test cases 7.1.1.2.1 and 7.1.1.3.1	16.2.0
2019-12	RAN#86	R5-198355	1174	-	F	Correction to ENDC RLC AM testcases 7.1.2.3.1 and 7.1.2.3.2	16.2.0
2019-12	RAN#86	R5-198361	1176	-	F	Update to test case 10.2.1.1 to align EPS bearer ID description	16.2.0
2019-12	RAN#86	R5-198362	1177	-	F	Update to test case 11.1.5 to align EPS bearer ID description	16.2.0
2019-12	RAN#86	R5-198438	1182	-	F	Updates of 5GC test case titles	16.2.0
2019-12	RAN#86	R5-198757	1199	-	F	Correction to test cases 8.1.1.2.3	16.2.0
2019-12	RAN#86	R5-198759	1200	-	F	Correction to NR MAC test case 7.1.1.3.2b	16.2.0
2019-12	RAN#86	R5-198772	1210	-	F	Correction to test case 9.1.5.2.7	16.2.0
2019-12	RAN#86	R5-198784	1214	-	F	Corrections to MAC Test Case 7.1.1.5.3	16.2.0
2019-12	RAN#86	R5-198786	1215	-	F	Update of 5GC TC 9.1.5.2.9	16.2.0
2019-12	RAN#86	R5-198825	1219	-	F	Update of test case 8.1.5.1.1	16.2.0
2019-12	RAN#86	R5-198874	1053	1	F	Addition of NR TC 6.1.2.11-systemInformationAreaID	16.2.0
2019-12	RAN#86	R5-198875	1060	1	F	Correction of NR test case 6.2.3.7-Inter-RAT cell reselection N2L, Snonintrasearch	16.2.0
2019-12	RAN#86	R5-198877	1132	1	F	Corrections to Idle Mode SoR Test Case 6.3.1.1	16.2.0
2019-12	RAN#86	R5-198878	1133	1	F	Corrections to Idle Mode SoR Test Case 6.3.1.2	16.2.0
2019-12	RAN#86	R5-198879	1178	1	F	Correction to FR1 power levels for several test cases	16.2.0
2019-12	RAN#86	R5-198880	1195	1	F	Update to test cases 6.1.1.7 and 6.1.1.8	16.2.0



2019-12	RAN#86	R5-198881	1196	1	F	Update to test cases 6.2.1.1 and 6.2.1.5	16.2.0
2019-12	RAN#86	R5-198882	1197	1	F	Update to test cases 6.2.1.2, 6.2.1.3 and 6.2.1.4	16.2.0
2019-12	RAN#86	R5-198883	1183	1	F	Update FR2 power of NR TC 7.1.1.1.3-SI request	16.2.0
2019-12	RAN#86	R5-198884	1091	1	F	Correction to NR MAC test case 7.1.1.4.2.1	16.2.0
2019-12	RAN#86	R5-198885	1129	1	F	Correction to NR MAC transport size selection test cases	16.2.0
2019-12	RAN#86	R5-198886	1145	1	F	Corrections to MAC Test Case 7.1.1.1.1	16.2.0
2019-12	RAN#86	R5-198887	1154	1	F	Update to NR MAC test case 7.1.1.1.5	16.2.0
2019-12	RAN#86	R5-198888	1158	1	F	Correction to EN-DC MAC Test Case 7.1.1.1.1a	16.2.0
2019-12	RAN#86	R5-198889	1184	1	F	Correction to MAC test case 7.1.1.7.1	16.2.0
2019-12	RAN#86	R5-198890	1186	1	F	Addition of new MAC test case for data inactivity timer	16.2.0
2019-12	RAN#86	R5-198891	1187	1	F	Split of CA MAC test case into 3 variants	16.2.0
2019-12	RAN#86	R5-198892	1095	1	F	Correction to NR test case 7.1.2.3.10-Re-transmission of RLC PDU	16.2.0
2019-12	RAN#86	R5-198893	1090	1	F	Correction to NR RLC test cases to accommodate the DCI format change to DCI_0_1	16.2.0
2019-12	RAN#86	R5-198894	1093	1	F	Correction to RLC UM test case 7.1.2.2.5	16.2.0
2019-12	RAN#86	R5-198900	1123	1	F	Correction to NR RLC test case 7.1.2.3.10	16.2.0
2019-12	RAN#86	R5-198901	1157	1	F	Correction to RLC test case 7.1.2.2.6 in EN-DC	16.2.0
2019-12	RAN#86	R5-198902	1172	1	F	Correction to RLC AM test case 7.1.2.3.9	16.2.0
2019-12	RAN#86	R5-198903	1193	1	F	Correction to RLC AM Test case 7.1.2.3.8	16.2.0
2019-12	RAN#86	R5-198904	1122	1	F	Correction to NR PDCP test case 7.1.3.4.2	16.2.0
2019-12	RAN#86	R5-198905	1141	1	F	Corrections to PDCP Test Case 7.1.3.5.2	16.2.0
2019-12	RAN#86	R5-198906	1150	1	F	Correction to PDCP TC 7.1.3.4.1	16.2.0
2019-12	RAN#86	R5-198907	1092	1	F	Corrections to SDAP test cases 7.1.4.1 and 7.1.4.2	16.2.0
2019-12	RAN#86	R5-198909	1221	-	F	Correction to NR TCs	16.2.0
2019-12	RAN#86	R5-198910	1175	1	F	Update to 5GS NR RRC test case 8.1.1.3.2	16.2.0
2019-12	RAN#86	R5-198911	1198	1	F	Correction to test case 8.1.1.2.1	16.2.0
2019-12	RAN#86	R5-198912	1201	1	F	Correction to test case 8.1.1.4.1	16.2.0
2019-12	RAN#86	R5-198913	1066	1	F	Addition of NR test case 8.1.2.1.2-uplinkTxDirectCurrentList	16.2.0
2019-12	RAN#86	R5-198914	1048	1	F	Update RRC reconfiguration test case 8.1.3.1.17.1	16.2.0
2019-12	RAN#86	R5-198915	1067	1	F	Addition of NR TC 8.1.3.3.1-CGI reporting of NR cell	16.2.0
2019-12	RAN#86	R5-198916	1068	1	F	Addition of NR TC 8.1.3.3.2-CGI reporting of E-UTRA cell	16.2.0
2019-12	RAN#86	R5-198917	1071	1	F	Correction to NR TC 8.1.3.1.5-Event A4 Intra-Freq	16.2.0
2019-12	RAN#86	R5-198918	1073	1	F	correction of NR TC 8.1.3.1.18.1-Additional measurement report of Intra-band Contiguous CA	16.2.0
2019-12	RAN#86	R5-198920	1222	-	F	correction of NR TCs 8.1.3.2.1 and TC 8.1.3.2.2	16.2.0
2019-12	RAN#86	R5-198921	1220	1	F	Update of test case 8.1.3.2.4	16.2.0
2019-12	RAN#86	R5-198922	1075	1	F	Correction to NR test case 8.1.4.2.2.1 E-UTRA To NR handover success	16.2.0
2019-12	RAN#86	R5-198923	1203	1	F	Correction to test case 8.1.4.2.2.1	16.2.0
2019-12	RAN#86	R5-198924	1119	1	F	Correction to 5GS SA RRC test case 8.1.4.1.5	16.2.0
2019-12	RAN#86	R5-198925	1077	1	F	Correction to NR test case 8.1.5.3.4-PWS reception using dedicatedSystemInformationDelivery	16.2.0
2019-12	RAN#86	R5-198926	1204	1	F	Correction to test case 8.1.5.5.1	16.2.0
2019-12	RAN#86	R5-198927	1173	1	F	Update to 5GS NR RRC test case 8.1.5.4.1	16.2.0
2019-12	RAN#86	R5-198928	1148	1	F	Correction to ENDC test case 8.2.2.8.1	16.2.0
2019-12	RAN#86	R5-198930	1216	1	F	Correction to test case 8.2.2.6.1	16.2.0
2019-12	RAN#86	R5-198931	1078	1	F	Correction to NR test case 8.2.3.11.X-ENDC-GAP	16.2.0
2019-12	RAN#86	R5-198932	1125	1	F	Correction to EN-DC RRC measurement test case 8.2.3.9.1	16.2.0
2019-12	RAN#86	R5-198933	1126	1	F	Correction to EN-DC RRC measurement test case 8.2.3.10.1	16.2.0
2019-12	RAN#86	R5-198935	1069	1	F	Addition of NR TC 8.2.6.2.1-Processing delay of ENDC	16.2.0
2019-12	RAN#86	R5-198937	1096	1	F	Addition of 5GC test case 9.1.1.5	16.2.0
2019-12	RAN#86	R5-198938	1152	1	F	Correction to 5GC test case 9.1.1.3	16.2.0
2019-12	RAN#86	R5-198939	1080	1	F	Correction to NR test case 9.1.2.1-NAS security mode command	16.2.0
2019-12	RAN#86	R5-198940	1100	1	F	Addition of new 5GC test case 9.1.2.4	16.2.0
2019-12	RAN#86	R5-198941	1101	1	F	Addition of new 5GC test case 9.1.2.5	16.2.0
2019-12	RAN#86	R5-198942	1103	1	F	Addition of new 5GC test case 9.1.2.7	16.2.0
2019-12	RAN#86	R5-198943	1104	1	F	Addition of new 5GC test case 9.1.2.8	16.2.0
2019-12	RAN#86	R5-198944	1102	1	F	Addition of new 5GC test case 9.1.2.6	16.2.0
2019-12	RAN#86	R5-198947	1052	1	F	Correction to 5GC TC 9.1.5.1.12	16.2.0
2019-12	RAN#86	R5-198948	1081	1	F	Correction to NR test case 9.1.5.1.10-PLMN not allowed	16.2.0
2019-12	RAN#86	R5-198949	1082	1	F	Correction to NR test case 9.1.6.1.2-Transmission failure of De-registration	16.2.0
2019-12	RAN#86	R5-198950	1084	1	F	Update of NR TC 9.1.7.2-Service request	16.2.0
2019-12	RAN#86	R5-198951	1140	1	F	Correction to 5GC NAS NSSAI Test Case 9.1.5.1.3	16.2.0
2019-12	RAN#86	R5-198952	1189	1	F	Correction to NR5GC testcase 9.1.5.1.5	16.2.0
2019-12	RAN#86	R5-198953	1208	1	F	Correction to test case 9.1.5.1.2	16.2.0
2019-12	RAN#86	R5-198954	1217	1	F	Update of 5GC TC 9.1.6.1.4	16.2.0
2019-12	RAN#86	R5-198972	1098	1	F	Correction to 5GC test case 10.1.2.1	16.2.0
2019-12	RAN#86	R5-198975	1112	1	F	Update of 11.1.7 Emergency call setup from NR RRC_IDLE - Emergency Services Fallback to EPS with redirection	16.2.0
2019-12	RAN#86	R5-198977	1224	-	F	Editorial improvements of Multilayer EPS Fallback test cases	16.2.0

2019-12	RAN#86	R5-198978	1161	1	F	Update EPS fallback test case 11.1.2	16.2.0
2019-12	RAN#86	R5-198979	1162	1	F	Update EPS fallback test case 11.1.5	16.2.0
2019-12	RAN#86	R5-198980	1163	1	F	Update EPS fallback test case 11.1.6	16.2.0
2019-12	RAN#86	R5-198981	1170	1	F	Correction to test case 11.1.4	16.2.0
2019-12	RAN#86	R5-198982	1171	1	F	Correction to test case 11.1.3	16.2.0
2019-12	RAN#86	R5-198985	1106	1	F	Addition of new UAC test case 11.3.4	16.2.0
2019-12	RAN#86	R5-198986	1113	1	F	Update to TC 11.4.1 5GMM-REGISTERED.NORMAL-SERVICE / 5GMM-IDLE / Emergency call / ... / New emergency PDU session	16.2.0
2019-12	RAN#86	R5-198987	1114	1	F	Update to TC 11.4.2 5GMM-DEREGISTERED.LIMITED-SERVICE / Emergency call / ... / Handling of forbidden PLMNs	16.2.0
2019-12	RAN#86	R5-198988	1115	1	F	Update to TC 11.4.3 5GMM-DEREGISTERED.NO-SUPI / Emergency call / ... / Initial registration for emergency services	16.2.0
2019-12	RAN#86	R5-198989	1116	1	F	Introduction of new TC 11.4.4 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE T3346 running / Emergency call establishment	16.2.0
2019-12	RAN#86	R5-198990	1117	1	F	Introduction of new 11.4.5 5GMM-REGISTERED.LIMITED-SERVICE / 5GMM-IDLE / Emergency call establishment and release / Handling of 5GS forbidden tracking areas for roaming	16.2.0
2019-12	RAN#86	R5-198991	1118	1	F	Introduction of new TC 11.4.6 5GMM-REGISTERED.NON-ALLOWED-SERVICE / Emergency call establishment and release / Handling of non-allowed tracking areas	16.2.0
2019-12	RAN#86	R5-199000	1185	1	F	Non 3GPP Access over WLAN test cases	16.2.0
2019-12	RAN#86	R5-199027	1190	1	F	Update of QBASED in pre-test condition for RSRQ test cases	16.2.0
2019-12	RAN#86	R5-199028	1194	1	F	Addition of NR Idle mode cell reselection test case 6.1.2.16	16.2.0
2019-12	RAN#86	R5-199029	1202	1	F	Correction to test case 8.1.1.4.2	16.2.0
2019-12	RAN#86	R5-199030	1156	1	F	Correction to RRC test case 8.2.2.1.1	16.2.0
2019-12	RAN#86	R5-199033	1223	1	F	Corrections to Test Case 8.2.4.1.1.1 and 8.2.4.1.1.2 and 8.2.4.1.1.3	16.2.0
2019-12	RAN#86	R5-199034	1207	1	F	Correction to test case 9.1.3.1	16.2.0
2019-12	RAN#86	R5-199035	1227	-	F	New 5GC NAS test case 10.1.4.1	16.2.0
2019-12	RAN#86	R5-199036	1086	1	F	Addition of new NR test case 11.3.6-Access Identity 2-accessibility AC7-RRC INACTIVE	16.2.0
2019-12	RAN#86	R5-199037	1105	1	F	Addition of new UAC test case 11.3.3	16.2.0
2019-12	RAN#86	R5-199038	1191	1	F	Correction to RRC test case 8.1.3.1.2	16.2.0
2019-12	RAN#86	R5-199072	1107	2	F	Update of 5G Idle test case 6.1.2.23	16.2.0
2019-12	RAN#86	R5-199095	1225	1	F	Correction to NR RRC Test case 8.1.5.6.3	16.2.0
2019-12	RAN#86	R5-199096	1212	1	F	Correction to test cases 8.2.3.6.1 / 1a and 1b	16.2.0
2019-12	RAN#86	R5-199097	1228	1	F	Corrections to EN-DC inter frequency and inter band measurement test cases	16.2.0
2019-12	RAN#86	R5-199098	1079	2	F	Correction to NR test case 9.1.1.6-5G AKA authentication abnormal	16.2.0
2019-12	RAN#86	R5-199099	1211	2	F	Correction to test case 9.1.7.1	16.2.0
2019-12	RAN#86	R5-199101	1051	2	F	Correction to 5GC TC 9.1.5.1.11	16.2.0
2019-12	RAN#86	R5-199102	1226	1	F	Correction to NR Idle mode test case 6.1.2.1	16.2.0
2020-03	RAN#87	R5-200148	1250	-	F	Correction to test case 6.1.1.6	16.3.0
2020-03	RAN#87	R5-200150	1252	-	F	Correction to test case 8.1.3.1.16	16.3.0
2020-03	RAN#87	R5-200175	1268	-	F	Correction to NR TC 6.2.3.9-Speed Dependent Cell Reselection N2L	16.3.0
2020-03	RAN#87	R5-200182	1275	-	F	Correction to NR TC 8.1.2.1.2-uplinkTxDirectCurrentList	16.3.0
2020-03	RAN#87	R5-200185	1278	-	F	Correction to NR TC 8.1.4.1.6-Handover Failure	16.3.0
2020-03	RAN#87	R5-200187	1280	-	F	Correction to NR TC 8.1.4.1.8.1-SCell no change Intra-band Contiguous CA	16.3.0
2020-03	RAN#87	R5-200188	1281	-	F	Correction to NR TC 8.1.4.2.2.1-L2N Handover	16.3.0
2020-03	RAN#87	R5-200195	1285	-	F	Correction to NR TC 9.1.1.1-EAP-AKA related procedures	16.3.0
2020-03	RAN#87	R5-200205	1295	-	F	Correction to NR TC 9.1.5.2.2-Periodic Register T3512	16.3.0
2020-03	RAN#87	R5-200206	1296	-	F	Correction to NR TC 9.1.5.2.8-Registration Reject 10	16.3.0
2020-03	RAN#87	R5-200208	1298	-	F	Correction to NR TC 9.1.6.1.3-Deregistration in new TA	16.3.0
2020-03	RAN#87	R5-200211	1301	-	F	Correction to NR TC 9.3.1.1-5GC to EPC	16.3.0
2020-03	RAN#87	R5-200213	1303	-	F	Correction to NR TC 10.1.1.1-Authentication during PDU establish	16.3.0
2020-03	RAN#87	R5-200214	1304	-	F	Correction to NR TC 10.1.1.2-Authentication after PDU establish	16.3.0
2020-03	RAN#87	R5-200221	1311	-	F	Correction to NR RLC testcase 7.1.2.3.10	16.3.0
2020-03	RAN#87	R5-200226	1313	-	F	Adding core specs to section References	16.3.0
2020-03	RAN#87	R5-200227	1314	-	F	Corrections to IMS Emergency Services TC 11.4.1	16.3.0
2020-03	RAN#87	R5-200229	1316	-	F	Corrections to IMS Emergency Services TC 11.4.2	16.3.0
2020-03	RAN#87	R5-200230	1317	-	F	Corrections to IMS Emergency Services TC 11.4.4	16.3.0
2020-03	RAN#87	R5-200232	1319	-	F	Corrections to IMS Emergency Services TC 11.4.6	16.3.0
2020-03	RAN#87	R5-200233	1320	-	F	Introduction of new TC 11.4.7 Handling of Local and extended emergency numbers / Mobility	16.3.0
2020-03	RAN#87	R5-200234	1321	-	F	Introduction of new TC 11.4.8 Handling of Local and extended emergency numbers / Switch-off and maximum local numbers storage	16.3.0
2020-03	RAN#87	R5-200250	1326	-	F	Corrections to NR RLC test case 7.1.2.3.8	16.3.0
2020-03	RAN#87	R5-200253	1329	-	F	Corrections to EN-DC test case 8.2.2.3.1	16.3.0

2020-03	RAN#87	R5-200254	1330	-	F	Corrections to 5GC test case 9.1.5.1.1	16.3.0
2020-03	RAN#87	R5-200338	1332	-	F	Correction to NR TC 6.1.1.3-Cell reselection of ePLMN in manual mode	16.3.0
2020-03	RAN#87	R5-200339	1333	-	F	Correction to NR TC 6.4.1.2-Cell reselection of ePLMN in manual mode INACTIVE	16.3.0
2020-03	RAN#87	R5-200341	1335	-	F	Correction to NR TC 8.1.3.1.17.1-Event A6	16.3.0
2020-03	RAN#87	R5-200347	1338	-	F	Correction to NR test case 8.1.5.2.1	16.3.0
2020-03	RAN#87	R5-200354	1342	-	F	Correction to 5G RRC test case 8.1.1.2.3	16.3.0
2020-03	RAN#87	R5-200355	1343	-	F	Correction to 5G RRC test case 8.1.1.4.1	16.3.0
2020-03	RAN#87	R5-200357	1345	-	F	Correction to 5G UAC test case 11.3.3	16.3.0
2020-03	RAN#87	R5-200358	1346	-	F	Correction to 5G UAC test case 11.3.4	16.3.0
2020-03	RAN#87	R5-200360	1348	-	F	Update of 5GC test case 10.1.3.1	16.3.0
2020-03	RAN#87	R5-200366	1351	-	F	Correction of NR test case 6.4.3.1-Inter-RAT cell reselection in RRC INACTIVE	16.3.0
2020-03	RAN#87	R5-200551	1354	-	F	Correction to NR PDCP test case 7.1.3.5.5	16.3.0
2020-03	RAN#87	R5-200579	1358	-	F	Corrections to RRC TC 8.2.2.7.1	16.3.0
2020-03	RAN#87	R5-200583	1362	-	F	Correction to RRC TC 8.2.2.5.1	16.3.0
2020-03	RAN#87	R5-200587	1365	-	F	Correction to 5G TC 9.1.5.2.1	16.3.0
2020-03	RAN#87	R5-200616	1373	-	F	Update to 5GC test case 9.1.1.3 in 38.523-1	16.3.0
2020-03	RAN#87	R5-200622	1375	-	F	Inclusion of 5G-NR Idle Mode TC 6.1.2.19 - Speed-dependent cell reselection	16.3.0
2020-03	RAN#87	R5-200623	1376	-	F	Update of RRC TC 8.1.5.6.5.1	16.3.0
2020-03	RAN#87	R5-200625	1377	-	F	Update of RRC TC 8.2.3.12.1	16.3.0
2020-03	RAN#87	R5-200634	1378	-	F	Corrections to NR MAC Test Case	16.3.0
2020-03	RAN#87	R5-200673	1382	-	F	Editorial correction: Assign title to section 10.1.4	16.3.0
2020-03	RAN#87	R5-200675	1384	-	F	Correction to NR Idle mode test case 6.1.2.1	16.3.0
2020-03	RAN#87	R5-200680	1386	-	F	Correction to NSSAI TC 9.1.5.1.3	16.3.0
2020-03	RAN#87	R5-200803	1398	-	F	Correction to NR TC 8.1.3.1.23-Intra NR measurements	16.3.0
2020-03	RAN#87	R5-200872	1403	-	F	Correction to Multilayer TC 11.1.5	16.3.0
2020-03	RAN#87	R5-200877	1404	-	F	Correction to Multilayer TC 11.1.6	16.3.0
2020-03	RAN#87	R5-200997	1249	1	F	Correction to EN-DC RRC Test case 8.2.3.2.1	16.3.0
2020-03	RAN#87	R5-200999	1230	1	F	Correction to NR RLC test case 7.1.2.3.5	16.3.0
2020-03	RAN#87	R5-201000	1248	1	F	Correction to NR PDCP test case 7.1.3.5.3	16.3.0
2020-03	RAN#87	R5-201001	1236	1	F	Correction to NR SDAP test case 7.1.4.2	16.3.0
2020-03	RAN#87	R5-201002	1243	1	F	Correction to 5GMM test case 9.1.5.1.8	16.3.0
2020-03	RAN#87	R5-201006	1389	1	F	Correction to NR TC 6.1.2.11-Area Specific SIBs using systemInformationAreaID	16.3.0
2020-03	RAN#87	R5-201007	1368	1	F	Editorial Correction to TC 8.1.1.1.2	16.3.0
2020-03	RAN#87	R5-201009	1379	1	F	Correction to Non 3GPP Access test cases	16.3.0
2020-03	RAN#87	R5-201018	1374	1	F	Correction to NR test case 8.2.3.8.1x	16.3.0
2020-03	RAN#87	R5-201031	1312	1	F	Adding generic test parameters references and updating subclause 5	16.3.0
2020-03	RAN#87	R5-201032	1315	1	F	Update to IMS Emergency Services TC 11.4.1 for adding new TPs	16.3.0
2020-03	RAN#87	R5-201033	1318	1	F	Update of TC 11.4.4 5G Emergency Services to add a new TP	16.3.0
2020-03	RAN#87	R5-201084	1287	1	F	Correction to NR TC 9.1.1.6-5G AKA abnormal	16.3.0
2020-03	RAN#87	R5-201085	1288	1	F	Correction to NR TC 9.1.2.2-Initial NAS msg ciphering	16.3.0
2020-03	RAN#87	R5-201086	1290	1	F	Correction to NR TC 9.1.5.1.2-Equivalent PLMN list handling	16.3.0
2020-03	RAN#87	R5-201087	1293	1	F	Correction to NR TC 9.1.5.1.9-Change of cell into a new tracking area	16.3.0
2020-03	RAN#87	R5-201088	1299	1	F	Correction to NR TC 9.1.7.2-Service Request	16.3.0
2020-03	RAN#87	R5-201089	1300	1	F	Correction to NR TC 9.1.8.1-SMS	16.3.0
2020-03	RAN#87	R5-201094	1353	1	F	Correction to EN-DC RLC test case 7.1.2.3.11	16.3.0
2020-03	RAN#87	R5-201095	1385	1	F	Correction to NR RLC AM test case 7.1.2.3.9	16.3.0
2020-03	RAN#87	R5-201096	1355	1	F	Correction to NR PDCP Test cases 7.1.3.2.1, 7.1.3.2.2 and 7.1.3.2.3	16.3.0
2020-03	RAN#87	R5-201097	1381	1	F	Correction to NR RRC measurement test case for SINR report of serving cell	16.3.0
2020-03	RAN#87	R5-201098	1393	1	F	Correction NR CA Test case 8.2.4.1.1.1	16.3.0
2020-03	RAN#87	R5-201100	1369	1	F	Corrections to MAC TC 7.1.1.1.2	16.3.0
2020-03	RAN#87	R5-201101	1359	1	F	Corrections to RRC TC 8.2.2.8.1	16.3.0
2020-03	RAN#87	R5-201103	1395	1	F	Correction to test case 11.1.2	16.3.0
2020-03	RAN#87	R5-201107	1256	1	F	Correction to 5GC TC 10.1.3.2	16.3.0
2020-03	RAN#87	R5-201112	1262	1	F	Correction to NR TC 6.1.2.21-Cell reselection	16.3.0
2020-03	RAN#87	R5-201113	1322	1	F	Correction to NR TC 6.1.2.4-Cell Reselection for interband operation	16.3.0
2020-03	RAN#87	R5-201114	1323	1	F	Correction to NR TC 6.1.2.5-Cell reselection for interband operation Between FDD and TDD	16.3.0
2020-03	RAN#87	R5-201115	1334	1	F	Correction to NR TC 6.1.2.18-Cell reselection with parameters Sintrasearch and Snonintrasearch	16.3.0
2020-03	RAN#87	R5-201117	1336	1	F	Correction to NR test case 7.1.2.3.6	16.3.0
2020-03	RAN#87	R5-201118	1337	1	F	Correction to NR test case 8.1.3.2.2	16.3.0
2020-03	RAN#87	R5-201119	1339	1	F	Correction to NR test case 9.1.5.2.6	16.3.0
2020-03	RAN#87	R5-201125	1258	1	F	Correction to NR TC 6.1.1.2-PLMN selection of Other PLMN	16.3.0

2020-03	RAN#87	R5-201126	1259	1	F	Correction to NR TC 6.1.1.4-PLMN selection in shared network environment with Automatic mode	16.3.0
2020-03	RAN#87	R5-201127	1260	1	F	Correction to NR TC 6.1.1.5-PLMN selection with Automatic mode and user reselection	16.3.0
2020-03	RAN#87	R5-201128	1263	1	F	Correction to NR TC 6.1.2.22-Inter frequency cell reselection based on common priority information	16.3.0
2020-03	RAN#87	R5-201129	1264	1	F	Correction to NR TC 6.2.3.2-Inter-RAT cell reselection L2N	16.3.0
2020-03	RAN#87	R5-201130	1265	1	F	Correction to NR TC 6.2.3.5-Inter-RAT cell reselection N2L by dedicated signalling	16.3.0
2020-03	RAN#87	R5-201131	1266	1	F	Correction to NR TC 6.2.3.6-Inter-RAT cell reselection	16.3.0
2020-03	RAN#87	R5-201132	1267	1	F	Correction to NR TC 6.2.3.8-Inter-RAT cell reselection L2N Snonintrasearch	16.3.0
2020-03	RAN#87	R5-201133	1269	1	F	Correction to NR TC 6.4.2.1-Inactive-Reselection	16.3.0
2020-03	RAN#87	R5-201134	1270	1	F	Correction to NR TC 7.1.1.1.4-Beam Failure	16.3.0
2020-03	RAN#87	R5-201135	1272	1	F	Correction to NR TC 8.1.1.3.1-Redirection	16.3.0
2020-03	RAN#87	R5-201136	1273	1	F	Correction to NR TC 8.1.1.3.3-With priority information of NR Cell	16.3.0
2020-03	RAN#87	R5-201137	1274	1	F	Correction to NR TC 8.1.1.3.4-With priority information of LTE Cell	16.3.0
2020-03	RAN#87	R5-201138	1276	1	F	Correction to NR TC 8.1.3.3.1-NR CGI	16.3.0
2020-03	RAN#87	R5-201139	1277	1	F	Correction to NR TC 8.1.3.3.2-LTE CGI	16.3.0
2020-03	RAN#87	R5-201140	1279	1	F	Correction to NR TC 8.1.4.1.7.1-PCell Change and SCell addition Intra-band Contiguous CA	16.3.0
2020-03	RAN#87	R5-201141	1282	1	F	Correction to NR TC 8.2.1.1.1-UE Capability	16.3.0
2020-03	RAN#87	R5-201142	1286	1	F	Correction to NR TC 9.1.1.2-Authentication Reject	16.3.0
2020-03	RAN#87	R5-201143	1289	1	F	Correction to NR TC 9.1.4.1-Generic UE configuration update	16.3.0
2020-03	RAN#87	R5-201144	1294	1	F	Correction to NR TC 9.1.5.1.14-RegisterReject 22 and T3346	16.3.0
2020-03	RAN#87	R5-201145	1297	1	F	Correction to NR TC 9.1.6.1.2-UE initiated deregistration procedure	16.3.0
2020-03	RAN#87	R5-201146	1306	1	F	Correction to NR TC 10.1.4.1-T3580	16.3.0
2020-03	RAN#87	R5-201149	1324	1	F	Update to NR MAC test case 7.1.1.1.5	16.3.0
2020-03	RAN#87	R5-201153	1310	1	F	Correction to NR RLC testcase 7.1.2.3.7	16.3.0
2020-03	RAN#87	R5-201170	1340	1	F	Correction to NR RRC measurement Test cases 8.1.3.1.13 and 8.1.3.1.14A	16.3.0
2020-03	RAN#87	R5-201171	1350	1	F	Correction to NR test case 6.2.3.1	16.3.0
2020-03	RAN#87	R5-201200	1302	1	F	Correction to NR TC 9.3.1.2-Inter-system mobility registration update EPC to 5GC	16.3.0
2020-03	RAN#87	R5-201204	1253	1	F	Update to test case 8.2.2.2.1	16.3.0
2020-03	RAN#87	R5-201206	1257	1	F	Correction to NR TC 6.1.1.1-PLMN selection with Automatic mode	16.3.0
2020-03	RAN#87	R5-201208	1231	1	F	Correction to Inter-frequency Cell reselection test case 6.1.2.20	16.3.0
2020-03	RAN#87	R5-201209	1232	1	F	Correction to NR Idle mode test case 6.1.2.9	16.3.0
2020-03	RAN#87	R5-201210	1233	1	F	Correction to NR MAC test case 7.1.1.1.2	16.3.0
2020-03	RAN#87	R5-201211	1234	1	F	Correction to NR RLC test case 7.1.2.2.6	16.3.0
2020-03	RAN#87	R5-201212	1237	1	F	Correction to NR RRC test case 8.1.1.4.1	16.3.0
2020-03	RAN#87	R5-201213	1239	1	F	Correction to NR5GC IRAT test case 8.1.3.2.1	16.3.0
2020-03	RAN#87	R5-201214	1247	1	F	Correction to NR5GC RRC test case 8.1.3.1.2	16.3.0
2020-03	RAN#87	R5-201215	1240	1	F	Correction to NR5GC IRAT test case 8.1.4.2.1.1	16.3.0
2020-03	RAN#87	R5-201216	1383	1	F	Correction to NR5GC RRC test case 8.1.1.2.1	16.3.0
2020-03	RAN#87	R5-201218	1327	1	F	Enhancement of NR PDCP test cases 7.1.3.1.x	16.3.0
2020-03	RAN#87	R5-201219	1328	1	F	Corrections to NR PDCP test case 7.1.3.4.1	16.3.0
2020-03	RAN#87	R5-201223	1347	1	F	Update of 5G Idle test case 6.1.2.23	16.3.0
2020-03	RAN#87	R5-201224	1341	1	F	Correction to 5G RRC test case 8.2.4.3.1	16.3.0
2020-03	RAN#87	R5-201225	1392	1	F	Correction to 5G RRC test case 8.2.4.3.1.3	16.3.0
2020-03	RAN#87	R5-201226	1352	1	F	Correction to 5GC test case 10.1.2.2	16.3.0
2020-03	RAN#87	R5-201227	1344	1	F	Correction to 5G UAC test case 11.3.6	16.3.0
2020-03	RAN#87	R5-201230	1399	1	F	Corrections to EN-DC RRC TC 8.2.2.1.1	16.3.0
2020-03	RAN#87	R5-201231	1402	1	F	Correction to Multilayer TC 11.1.1	16.3.0
2020-03	RAN#87	R5-201235	1396	2	F	Correction to NR Idle mode test case 6.1.2.3	16.3.0
2020-03	RAN#87	R5-201236	1397	2	F	Update of RRC TC 8.1.3.1.1	16.3.0
2020-03	RAN#87	R5-201241	1367	2	F	Correction to 5G TC 9.1.7.1	16.3.0
2020-06	RAN#88	R5-201326	1405	-	F	Correction to EN-DC Carrier Aggregation test case 8.2.4.1.1.1	16.4.0
2020-06	RAN#88	R5-201340	1408	-	F	Correction to NR TC 6.1.2.18-Cell reselection with Sintrasearch and Snonintrasearch	16.4.0
2020-06	RAN#88	R5-201341	1409	-	F	Correction to NR TC 6.1.2.19-N2N Speed dependent cell reselection	16.4.0
2020-06	RAN#88	R5-201344	1412	-	F	Correction to NR TC 6.2.3.9-N2L Speed dependent cell reselection	16.4.0
2020-06	RAN#88	R5-201349	1417	-	F	Correction to NR TC 6.4.1.1-PLMN selection Automatic mode in RRC_INACTIVE state	16.4.0
2020-06	RAN#88	R5-201353	1421	-	F	Correction to NR TC 8.1.2.1.4-RRC reconfiguration Dedicated RLF timer	16.4.0
2020-06	RAN#88	R5-201356	1424	-	F	Correction to NR TC 8.1.3.1.23-Continuation of the measurements after RRC Resume	16.4.0
2020-06	RAN#88	R5-201361	1429	-	F	Correction to NR TC 8.1.5.4.1-Reception of CounterCheck message by the UE	16.4.0



2020-06	RAN#88	R5-201367	1434	-	F	Addition of NR TC 8.1.5.8.1-Connected state latency check	16.4.0
2020-06	RAN#88	R5-201372	1439	-	F	Correction to NR TC 9.1.5.1.2-Equivalent PLMN list handling	16.4.0
2020-06	RAN#88	R5-201379	1446	-	F	Addition of new NR TC 11.3.5-UAC AI1-accessibility AC5-MMTEL-Video call	16.4.0
2020-06	RAN#88	R5-201431	1461	-	F	Correction to ENDC TC 7.1.3.3.2-Correct functionality of encryption algorithm AES	16.4.0
2020-06	RAN#88	R5-201432	1462	-	F	Correction to ENDC TC 7.1.3.3.3-Correct functionality of encryption algorithm ZUC	16.4.0
2020-06	RAN#88	R5-201440	1470	-	F	Correction to NR TC 6.1.2.2-Qqualmin Serving Cell non-suitable	16.4.0
2020-06	RAN#88	R5-201471	1479	-	F	Addition of NR TC 6.2.2.1-N2L Serving cell becomes non-suitable	16.4.0
2020-06	RAN#88	R5-201477	1482	-	F	Correction to FR1 power level table for several test cases to not to assign beyond maximum power level -78	16.4.0
2020-06	RAN#88	R5-201484	1485	-	F	Correction 7.1.2.3.7 to use downlink timing reference for scheduling less than 100ms timing gap	16.4.0
2020-06	RAN#88	R5-201499	1486	-	F	Correction to NR Idle mode test case 6.1.2.5	16.4.0
2020-06	RAN#88	R5-201500	1487	-	F	Correction to NR idle mode test case 6.4.2.2	16.4.0
2020-06	RAN#88	R5-201501	1488	-	F	Correction to NR MAC test case 7.1.1.1.1a	16.4.0
2020-06	RAN#88	R5-201502	1489	-	F	Correction to BWP Dependent Parameters for RA type 0 in MAC testcases	16.4.0
2020-06	RAN#88	R5-201519	1497	-	F	Corrections to MAC test cases for Logical Channel ID	16.4.0
2020-06	RAN#88	R5-201574	1499	-	F	Updates to NR RLC test case 7.1.2.3.11	16.4.0
2020-06	RAN#88	R5-201575	1500	-	F	Enhancement of NR PDCP test case 7.1.3.1.1	16.4.0
2020-06	RAN#88	R5-201578	1503	-	F	Correction to NR test cases 8.1.3.1.13 and 8.1.3.1.14A	16.4.0
2020-06	RAN#88	R5-201629	1510	-	F	Correction to 5GC TC 10.1.3.2	16.4.0
2020-06	RAN#88	R5-201632	1511	-	F	Corrections to RRC TCs 8.2.3.1.1, 8.2.3.2.1, 8.2.3.3.1 and 8.2.3.12.1	16.4.0
2020-06	RAN#88	R5-201633	1512	-	F	Addition of NR5G UAC TC 11.3.7	16.4.0
2020-06	RAN#88	R5-201637	1516	-	F	Corrections to NR5G MAC TC 7.1.1.3.1	16.4.0
2020-06	RAN#88	R5-201638	1517	-	F	Corrections to NR5G RRC TC 8.1.4.2.1.1	16.4.0
2020-06	RAN#88	R5-201644	1522	-	F	Corrections to NR5G NAS TC 9.1.6.1.4	16.4.0
2020-06	RAN#88	R5-201646	1524	-	F	Corrections to NR5G RRC TC 8.1.1.4.1	16.4.0
2020-06	RAN#88	R5-201650	1528	-	F	Corrections to NR5G SDAP TC 7.1.4.2	16.4.0
2020-06	RAN#88	R5-201651	1529	-	F	Corrections to NR5G RRC TC 8.1.5.4.1	16.4.0
2020-06	RAN#88	R5-201761	1538	-	F	Correction to NR UE Capability test case 8.2.1.1.1	16.4.0
2020-06	RAN#88	R5-201790	1539	-	F	Correction to NR idle mode test case 6.4.2.1	16.4.0
2020-06	RAN#88	R5-201791	1540	-	F	Correction to NR5GC IRAT test case 6.2.3.1	16.4.0
2020-06	RAN#88	R5-201793	1542	-	F	Removal of requirement of USIM configuration 14 from 5GMM Idle mode test cases	16.4.0
2020-06	RAN#88	R5-201802	1545	-	F	Update of RRC TC 8.2.3.12.1	16.4.0
2020-06	RAN#88	R5-201913	1547	-	F	Update of RRC TC 8.1.5.6.5.1	16.4.0
2020-06	RAN#88	R5-201943	1549	-	F	Correction to NR TC 6.2.3.4-inter-RAT reselection	16.4.0
2020-06	RAN#88	R5-202026	1559	-	F	Corrections to NR MAC Test Case 7.1.1.3.2b	16.4.0
2020-06	RAN#88	R5-202048	1560	-	F	Corrections to EN-DC test case 8.2.3.12.1	16.4.0
2020-06	RAN#88	R5-202107	1561	-	F	Editorial Corrections to NR5G MAC TC 7.1.1.1.2	16.4.0
2020-06	RAN#88	R5-202140	1564	-	F	Addition of new DRX TC 7.1.1.5.5 for short DRX configured and Long DRX command MAC CE is received	16.4.0
2020-06	RAN#88	R5-202178	1566	-	F	Correction to 5G test case 6.2.1.2	16.4.0
2020-06	RAN#88	R5-202183	1567	-	F	Editorial update to NR measurements test case 8.1.3.1.2	16.4.0
2020-06	RAN#88	R5-202185	1568	-	F	Correction to 5G test case 6.2.1.3	16.4.0
2020-06	RAN#88	R5-202205	1569	-	F	Correction to 5G test case 6.2.1.4	16.4.0
2020-06	RAN#88	R5-202221	1572	-	F	Removal of 5GC test case 10.1.3.1	16.4.0
2020-06	RAN#88	R5-202411	1581	-	F	Correction to EN-DC RRC test case 8.2.2.1.1	16.4.0
2020-06	RAN#88	R5-202506	1584	-	F	Correction to NR PDCP test case 7.1.3.5.5	16.4.0
2020-06	RAN#88	R5-202530	1585	-	F	Correction to NR CA RRC test cases 8.1.3.1.18.x	16.4.0
2020-06	RAN#88	R5-202535	1442	1	F	Correction to NR TC 9.3.1.3-Handling of EPC relevant parameters	16.4.0
2020-06	RAN#88	R5-202537	1586	-	F	Correction to NR RRC IDLE testcase 6.1.2.1	16.4.0
2020-06	RAN#88	R5-202538	1587	-	F	Correction to the ENDC testcase 7.1.1.3.7	16.4.0
2020-06	RAN#88	R5-202539	1588	-	F	Correction to NR MAC test case 7.1.1.3.3	16.4.0
2020-06	RAN#88	R5-202540	1589	-	F	Correction to NR TC 8.2.3.2.1	16.4.0
2020-06	RAN#88	R5-202543	1554	1	F	Correction to NR MAC test case 7.1.1.3.1	16.4.0
2020-06	RAN#88	R5-202550	1555	1	F	Corrections to IMS Emergency Services TC 11.4.2	16.4.0
2020-06	RAN#88	R5-202551	1556	1	F	Introduction of new IMS Emergency TC 11.4.9 5GMM- DEREGISTERED.LIMITED-SERVICE No suitable cells in tracking area call	16.4.0
2020-06	RAN#88	R5-202592	1577	1	F	Adding generic test parameters references to section 5.3	16.4.0
2020-06	RAN#88	R5-202593	1406	1	F	Correction to NR TC 6.1.1.1-PLMN selection Automatic mode	16.4.0
2020-06	RAN#88	R5-202594	1407	1	F	Correction to NR TC 6.1.1.5-PLMN selection with Automatic mode and user reselection	16.4.0
2020-06	RAN#88	R5-202595	1411	1	F	Correction to NR TC 6.2.3.3-From NR RRC IDLE to E-UTRA IDLE	16.4.0
2020-06	RAN#88	R5-202596	1413	1	F	Correction to NR TC 6.3.1.1-Security check successful using List	16.4.0

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2020-06	RAN#88	R5-202597	1416	1	F	Correction to NR TC 6.3.1.4-Security check unsuccessful manual mode	16.4.0
2020-06	RAN#88	R5-202598	1449	1	F	Corrections to Idle Mode SoR Test Case 6.3.1.2	16.4.0
2020-06	RAN#88	R5-202599	1450	1	F	Corrections to Idle Mode SoR Test Case 6.3.1.3	16.4.0
2020-06	RAN#88	R5-202600	1452	1	F	Addition of Idle Mode SoR Test Case 6.3.1.5	16.4.0
2020-06	RAN#88	R5-202601	1453	1	F	Addition of Idle Mode SoR Test Case 6.3.1.7	16.4.0
2020-06	RAN#88	R5-202602	1480	1	F	Addition of NR TC 6.2.2.2-L2N Serving cell becomes non-suitable	16.4.0
2020-06	RAN#88	R5-202603	1531	1	F	Correction to NR5G Idle Mode TC 6.1.2.11	16.4.0
2020-06	RAN#88	R5-202604	1543	1	F	Correction to NR TC 6.3.1.8-SoR after registration Automatic mode	16.4.0
2020-06	RAN#88	R5-202605	1544	1	F	Correction to NR TC 6.3.1.9-SoR after registration Manual mode	16.4.0
2020-06	RAN#88	R5-202606	1570	1	F	Correction to test case 6.1.2.23	16.4.0
2020-06	RAN#88	R5-202607	1474	1	F	Correction to NR TC 7.1.1.4.2.x-TBS ambiguity of UL	16.4.0
2020-06	RAN#88	R5-202608	1490	1	F	Correction to NR MAC test case 7.1.1.4.2.3	16.4.0
2020-06	RAN#88	R5-202609	1558	1	F	Corrections to NR DRX Test Cases	16.4.0
2020-06	RAN#88	R5-202610	1574	1	F	Corrections to MAC TBS test cases with dynamicSwitch	16.4.0
2020-06	RAN#88	R5-202611	1583	1	F	Correction to NR MAC CA Test Case	16.4.0
2020-06	RAN#88	R5-202612	1498	1	F	Editorial corrections to NR RLC test cases 7.1.2.3.x	16.4.0
2020-06	RAN#88	R5-202613	1507	1	F	Correction to 7.1.2.3.3 and 7.1.2.3.4 to reduce test execution time	16.4.0
2020-06	RAN#88	R5-202614	1457	1	F	Correction to ENDC TC 7.1.3.2.1-Correct functionality of Integrity algorithm SNOW3G	16.4.0
2020-06	RAN#88	R5-202615	1458	1	F	Correction to ENDC TC 7.1.3.2.2-Correct functionality of Integrity algorithm AES	16.4.0
2020-06	RAN#88	R5-202616	1459	1	F	Correction to ENDC TC 7.1.3.2.3-Correct functionality of Integrity algorithm ZUC	16.4.0
2020-06	RAN#88	R5-202617	1460	1	F	Correction to ENDC TC 7.1.3.3.1-Correct functionality of encryption algorithm SNOW3G	16.4.0
2020-06	RAN#88	R5-202618	1520	1	F	Corrections to NR5G PDCP TC 7.1.3.4.1 and 7.1.3.4.2	16.4.0
2020-06	RAN#88	R5-202619	1418	1	F	Correction to NR TC 8.1.1.2.1-T300 expiry	16.4.0
2020-06	RAN#88	R5-202620	1419	1	F	Correction to NR TC 8.1.1.3.2-Redirection from NR to E-UTRA	16.4.0
2020-06	RAN#88	R5-202621	1464	1	F	Correction to test case 8.1.1.3.1	16.4.0
2020-06	RAN#88	R5-202622	1465	1	F	Correction to test case 8.1.1.3.3	16.4.0
2020-06	RAN#88	R5-202623	1466	1	F	Correction to test case 8.1.1.3.4	16.4.0
2020-06	RAN#88	R5-202624	1467	1	F	Correction to test case 8.1.1.4.1	16.4.0
2020-06	RAN#88	R5-202625	1468	1	F	Correction to test case 8.1.1.4.2	16.4.0
2020-06	RAN#88	R5-202626	1469	1	F	Correction to test case 8.1.2.1.1	16.4.0
2020-06	RAN#88	R5-202627	1515	1	F	Corrections to NR5G RRC TC 8.2.2.6.1	16.4.0
2020-06	RAN#88	R5-202628	1576	1	F	Update RRC TC 8.1.2.1.5	16.4.0
2020-06	RAN#88	R5-202629	1582	1	F	Corrections to EN-DC RRC TC 8.2.2.7.1	16.4.0
2020-06	RAN#88	R5-202630	1422	1	F	Correction to NR TC 8.1.3.1.11-Two RSRQ event A3	16.4.0
2020-06	RAN#88	R5-202631	1423	1	F	Correction to NR TC 8.1.3.1.16-Intra NR measurements with Whitelisting	16.4.0
2020-06	RAN#88	R5-202632	1425	1	F	Correction to NR TC 8.1.3.2.3-RSRQ event B2	16.4.0
2020-06	RAN#88	R5-202633	1426	1	F	Correction to NR TC 8.1.3.3.1-NR CGI	16.4.0
2020-06	RAN#88	R5-202634	1427	1	F	Correction to NR TC 8.1.3.3.2-LTE CGI	16.4.0
2020-06	RAN#88	R5-202635	1501	1	F	Corrections to NR measurement test cases 8.1.3.x	16.4.0
2020-06	RAN#88	R5-202636	1518	1	F	Corrections to NR5G RRC TC 8.1.3.1.15A	16.4.0
2020-06	RAN#88	R5-202637	1536	1	F	Correction to NR TC 8.1.3.1.15a-Intra NR measurements with Blacklisting	16.4.0
2020-06	RAN#88	R5-202638	1550	1	F	Correction to NR TC 8.1.3.2.4-SINR event B2	16.4.0
2020-06	RAN#88	R5-202639	1428	1	F	Correction to NR TC 8.1.4.2.2.1-L2N handover	16.4.0
2020-06	RAN#88	R5-202640	1492	1	F	Correction to NR5GC IRAT test case 8.1.4.2.1.1	16.4.0
2020-06	RAN#88	R5-202641	1563	1	F	Correction to NR RRC test case 8.1.4.1.2 to update the security	16.4.0
2020-06	RAN#88	R5-202642	1433	1	F	Addition of NR TC 8.1.5.7.1-MCG RLC failure	16.4.0
2020-06	RAN#88	R5-202643	1506	1	F	Updates on RRC others TC 8.1.5.2.2	16.4.0
2020-06	RAN#88	R5-202644	1546	1	F	Corrections to NR5G RRC TC 8.1.5.5.1	16.4.0
2020-06	RAN#88	R5-202645	1483	1	F	Correction to 8.2.2.8.1 not to check reception of RRCReconfigurationComplete if RRCReconfiguration is not sent	16.4.0
2020-06	RAN#88	R5-202646	1493	1	F	Correction to EN-DC RRC test case 8.2.2.7.1	16.4.0
2020-06	RAN#88	R5-202647	1505	1	F	Corrections to EN-DC test case 8.2.2.3.1	16.4.0
2020-06	RAN#88	R5-202648	1526	1	F	Addition of NRDC RRC TC 8.2.2.4.2	16.4.0
2020-06	RAN#88	R5-202649	1527	1	F	Addition of NRDC RRC TC 8.2.2.5.2	16.4.0
2020-06	RAN#88	R5-202650	1435	1	F	Addition of NR TC 8.2.3.16.1-MeasConfig via SRB3	16.4.0
2020-06	RAN#88	R5-202651	1504	1	F	Corrections to NR measurement test cases 8.2.3.x	16.4.0
2020-06	RAN#88	R5-202652	1475	1	F	Correction to NR TC 8.2.4.2.1.x-CA release	16.4.0
2020-06	RAN#88	R5-202653	1537	1	F	Corrections to EN-DC test case 8.2.4.3.1.1	16.4.0
2020-06	RAN#88	R5-202654	1436	1	F	Addition of NR TC 8.2.6.1.1-RLC failure	16.4.0
2020-06	RAN#88	R5-202655	1551	1	F	Corrections to 5GC Test Case 9.1.1.3	16.4.0
2020-06	RAN#88	R5-202656	1494	1	F	Correction to 5GMM test case 9.1.2.1	16.4.0
2020-06	RAN#88	R5-202657	1495	1	F	Correction to 5GMM test case 9.1.4.1	16.4.0
2020-06	RAN#88	R5-202658	1438	1	F	Correction to NR TC 9.1.5.1.3-NSSAI handling	16.4.0
2020-06	RAN#88	R5-202659	1440	1	F	Correction to NR TC 9.1.5.1.9-Change of cell into a new tracking	16.4.0

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2020-06	RAN#88	R5-202660	1508	1	F	Correction to NR TC 9.1.6.1.3-Deregistration in new TA	16.4.0
2020-06	RAN#88	R5-202661	1530	1	F	Corrections to NR5G NAS TC 9.1.7.2	16.4.0
2020-06	RAN#88	R5-202662	1578	1	F	Correction to test case 9.1.7.1	16.4.0
2020-06	RAN#88	R5-202663	1573	1	F	Addition to 5GC SMS test case 9.1.8.2	16.4.0
2020-06	RAN#88	R5-202664	1444	1	F	Correction to NR TC 10.1.4.1-T3580 expiry	16.4.0
2020-06	RAN#88	R5-202665	1476	1	F	Update of multilayer test case 11.1.5	16.4.0
2020-06	RAN#88	R5-202666	1477	1	F	Update of multilayer test case 11.1.6	16.4.0
2020-06	RAN#88	R5-202667	1478	1	F	Update of multilayer test case 11.1.2	16.4.0
2020-06	RAN#88	R5-202668	1445	1	F	Addition of new NR TC 11.3.1-UAC AI0-MTSI MO speech call-SMSoIP-Uplink User data transfer	16.4.0
2020-06	RAN#88	R5-202669	1447	1	F	Addition of new NR TC 11.3.9-UAC Operator Defined Access Category	16.4.0
2020-06	RAN#88	R5-202670	1513	1	F	Addition of NR5G UAC TC 11.3.8	16.4.0
2020-06	RAN#88	R5-202671	1571	1	F	Update to UAC test case 11.3.4	16.4.0
2020-06	RAN#88	R5-202672	1557	1	F	Introduction of new IMS emergency TC 11.4.10 5GMM-REGISTERED.NORMAL-SERVICE N26 interface not supported N1 to S1	16.4.0
2020-09	RAN#89	R5-203363	1590	-	F	Correction to NR TC 6.1.1.1-PLMN selection in automatic mode	16.5.0
2020-09	RAN#89	R5-203367	1594	-	F	Correction to NR TC 6.1.1.5-PLMN selection in Automatic mode User reselection	16.5.0
2020-09	RAN#89	R5-203372	1599	-	F	Correction to NR TC 6.1.2.21-Cell reselection	16.5.0
2020-09	RAN#89	R5-203373	1600	-	F	Correction to NR TC 6.1.2.23-Cell Reselection MFBI	16.5.0
2020-09	RAN#89	R5-203374	1601	-	F	Correction to NR TC 6.2.1.1-Selection of correct RAT for OPLMN	16.5.0
2020-09	RAN#89	R5-203375	1602	-	F	Correction to NR TC 6.2.1.4-Inter-RAT PLMN Selection with Manual mode	16.5.0
2020-09	RAN#89	R5-203377	1604	-	F	Correction to NR TC 6.2.3.9-Inter-RAT Speed Dependent Cell Reselection	16.5.0
2020-09	RAN#89	R5-203382	1609	-	F	Correction to NR TC 6.4.1.1-PLMN Selection	16.5.0
2020-09	RAN#89	R5-203383	1610	-	F	Correction to NR TC 7.1.1.1.1-Correct selection of RACH parameters	16.5.0
2020-09	RAN#89	R5-203389	1616	-	F	Correction to NR TC 8.1.1.3.1-Redirection to another NR frequency	16.5.0
2020-09	RAN#89	R5-203394	1621	-	F	Correction to NR TC 8.1.3.1.15A-Intra NR measurements Blacklisting	16.5.0
2020-09	RAN#89	R5-203396	1623	-	F	Correction to NR TC 8.1.5.7.1-X-RLC Failure MCG	16.5.0
2020-09	RAN#89	R5-203397	1624	-	F	Correction to ENDC TC 8.2.2.1.1-SRB3	16.5.0
2020-09	RAN#89	R5-203398	1625	-	F	Addition of NRDC TC 8.2.2.1.2-SRB3	16.5.0
2020-09	RAN#89	R5-203403	1630	-	F	Correction to ENDC TC 8.2.3.11.X-Measurement Gap	16.5.0
2020-09	RAN#89	R5-203405	1632	-	F	Correction to ENDC TC 8.2.6.1.1.X-RLC Failure SCG	16.5.0
2020-09	RAN#89	R5-203406	1633	-	F	Addition of NRDC TC 8.2.6.1.2.1-RLC Failure SCG intra-band	16.5.0
2020-09	RAN#89	R5-203407	1634	-	F	Addition of NRDC TC 8.2.6.1.2.2-RLC Failure SCG inter-band	16.5.0
2020-09	RAN#89	R5-203408	1635	-	F	Addition of NRDC TC 8.2.6.1.2.3-RLC Failure SCG intra-band NC	16.5.0
2020-09	RAN#89	R5-203409	1636	-	F	Correction to ENDC TC 8.2.6.2.1-Processing delay	16.5.0
2020-09	RAN#89	R5-203412	1639	-	F	Correction to NR TC 9.1.5.1.1-Initial registration with 5G-GUTI reallocation	16.5.0
2020-09	RAN#89	R5-203413	1640	-	F	Correction to NR TC 9.1.5.1.8-Serving network not authorized	16.5.0
2020-09	RAN#89	R5-203481	1648	-	F	Correction to NR TC 6.1.1.4-PLMN selection in shared network environment	16.5.0
2020-09	RAN#89	R5-203502	1652	-	F	Correction to 5G NR Idle mode test case 6.4.2.2	16.5.0
2020-09	RAN#89	R5-203503	1653	-	F	Correction to NR CA RRC test cases 8.1.3.1.18.x	16.5.0
2020-09	RAN#89	R5-203504	1654	-	F	Correction to NR RRC test cases 8.1.3.2.3 and 8.1.3.2.4	16.5.0
2020-09	RAN#89	R5-203505	1655	-	F	Correction to 5GMM test case 9.1.5.1.13	16.5.0
2020-09	RAN#89	R5-203524	1661	-	F	Corrections to NR MAC Test Case 7.1.1.5.4	16.5.0
2020-09	RAN#89	R5-203535	1662	-	F	Splitting and updates to NR RLC test case 7.1.2.3.5	16.5.0
2020-09	RAN#89	R5-203539	1666	-	F	Correction to NR test case 8.1.3.1.15A	16.5.0
2020-09	RAN#89	R5-203540	1667	-	F	Editorial correction to EN-DC test case 8.2.3.5.1	16.5.0
2020-09	RAN#89	R5-203567	1671	-	F	Correction to NR TC 7.1.1.1.2-Random access procedure for Preamble selected by MAC itself	16.5.0
2020-09	RAN#89	R5-203648	1690	-	F	Editorial updates to NR5G Idle Mode TC 6.1.2.11	16.5.0
2020-09	RAN#89	R5-203649	1691	-	F	Corrections to NR5G BWP TC 7.1.1.8.1	16.5.0
2020-09	RAN#89	R5-203650	1692	-	F	Corrections to NR5G RRC NR-DC TC 8.2.2.4.2 and 8.2.2.5.2	16.5.0
2020-09	RAN#89	R5-203656	1695	-	F	Corrections to NR5G MAC DRX TC 7.1.1.5.3	16.5.0
2020-09	RAN#89	R5-203657	1696	-	F	Corrections to NR5G RRC TC 8.1.3.1.16	16.5.0
2020-09	RAN#89	R5-203658	1697	-	F	Void NR5G NAS TC 9.1.5.2.6	16.5.0
2020-09	RAN#89	R5-203659	1698	-	F	Corrections to NR5G MAC TC 7.1.1.2.1	16.5.0
2020-09	RAN#89	R5-203665	1703	-	F	Corrections to NR5G RRC CA TCs to add Data Path verification	16.5.0
2020-09	RAN#89	R5-203666	1704	-	F	Corrections to ENDC RRC CA TCs to add Data Path verification	16.5.0
2020-09	RAN#89	R5-203706	1708	-	F	Correction to NR test case 7.1.2.3.1	16.5.0
2020-09	RAN#89	R5-203709	1711	-	F	Correction to NR test case 8.1.3.1.5	16.5.0
2020-09	RAN#89	R5-203710	1712	-	F	Correction to NR test case 8.1.3.1.8	16.5.0
2020-09	RAN#89	R5-203728	1715	-	F	Correction to NR test case 8.1.3.1.16	16.5.0
2020-09	RAN#89	R5-203739	1717	-	F	Corrections to 5GS Non-3GPP Access TC 9.2.1.1	16.5.0



2020-09	RAN#89	R5-203740	1718	-	F	Corrections to 5GS Non-3GPP Access TC 9.2.5.1.4	16.5.0
2020-09	RAN#89	R5-203741	1719	-	F	Corrections to 5GS Non-3GPP Access TC 9.2.7.1	16.5.0
2020-09	RAN#89	R5-203742	1720	-	F	Corrections to 5GS Non-3GPP Access TC 9.2.7.2	16.5.0
2020-09	RAN#89	R5-203745	1721	-	F	Correction to 5G NR Idle mode test case 6.4.3.1	16.5.0
2020-09	RAN#89	R5-203772	1727	-	F	Correction to NR5GC testcase 9.1.4.1	16.5.0
2020-09	RAN#89	R5-203785	1728	-	F	Correction to NR5GC testcase 10.1.1.2	16.5.0
2020-09	RAN#89	R5-203810	1729	-	F	Correction to NR5GC test case 6.1.2.9	16.5.0
2020-09	RAN#89	R5-203811	1730	-	F	Correction to NR CA RRC Test cases 8.1.3.1.17.x and 8.1.3.1.18.x	16.5.0
2020-09	RAN#89	R5-204015	1733	-	F	Correction of NR TC 6.2.2.1	16.5.0
2020-09	RAN#89	R5-204016	1734	-	F	Correction to NR TC 8.1.4.1.8.X-Scell no change	16.5.0
2020-09	RAN#89	R5-204018	1735	-	F	Correction of NR TC 6.2.2.2	16.5.0
2020-09	RAN#89	R5-204019	1736	-	F	Correction to NR5G UAC TC 11.3.8	16.5.0
2020-09	RAN#89	R5-204107	1740	-	F	Correction to NR test case 7.1.2.3.11	16.5.0
2020-09	RAN#89	R5-204217	1744	-	F	Addition of NR-DC RRC test case 8.2.2.9.2	16.5.0
2020-09	RAN#89	R5-204237	1746	-	F	Correction to NR5G RRC TC 8.1.4.1.2	16.5.0
2020-09	RAN#89	R5-204254	1748	-	F	Correction to NR UE Capability test case 8.1.5.1.1	16.5.0
2020-09	RAN#89	R5-204334	1749	-	F	Correction to NR5GC RRC test case 8.1.5.2.2	16.5.0
2020-09	RAN#89	R5-204336	1750	-	F	Correction to test case 11.1.3	16.5.0
2020-09	RAN#89	R5-204341	1751	-	F	Correction to the NR5GC testcase 8.1.3.1.12	16.5.0
2020-09	RAN#89	R5-204359	1754	-	F	Correction to NR test case 8.1.4.1.6	16.5.0
2020-09	RAN#89	R5-204363	1755	-	F	Corrections to NR5G PDCP TC 7.1.3.4.1	16.5.0
2020-09	RAN#89	R5-204372	1756	-	F	Correction to NR5GC CA RRC test cases 8.1.2.1.5.x	16.5.0
2020-09	RAN#89	R5-204379	1678	1	F	Correction to Idle mode test case 6.4.1.2	16.5.0
2020-09	RAN#89	R5-204380	1680	1	F	Correction to Idle mode test case 6.1.2.9	16.5.0
2020-09	RAN#89	R5-204381	1689	1	F	Correction to the power level of NR RRC TC 8.1.1.2.1 and 8.1.1.4.1	16.5.0
2020-09	RAN#89	R5-204382	1739	1	F	Correction to NR RRC TC 8.1.3.2.2	16.5.0
2020-09	RAN#89	R5-204403	1592	1	F	Correction to NR TC 6.1.1.2-access technology combinations	16.5.0
2020-09	RAN#89	R5-204404	1596	1	F	Correction to NR TC 6.1.1.7-PLMN selection of RPLMN or HPLMN in Automatic mode	16.5.0
2020-09	RAN#89	R5-204405	1598	1	F	Correction to NR TC 6.1.2.19-Speed-dependent cell reselection	16.5.0
2020-09	RAN#89	R5-204406	1603	1	F	Correction to NR TC 6.2.1.5-Inter-RAT Background HPLMN Search with Automatic Mode	16.5.0
2020-09	RAN#89	R5-204407	1605	1	F	Correction to NR TC 6.3.1.1-SOR during registration with security check successful using List Type 1	16.5.0
2020-09	RAN#89	R5-204408	1606	1	F	Correction to NR TC 6.3.1.2-SOR during registration with security check successful but no requested acknowledgement	16.5.0
2020-09	RAN#89	R5-204409	1608	1	F	Correction to NR TC 6.3.1.5-SOR during registration with no SOR information received	16.5.0
2020-09	RAN#89	R5-204410	1645	1	F	Correction to Idle Mode SoR TC 6.3.1.7	16.5.0
2020-09	RAN#89	R5-204411	1647	1	F	Correction to NR TC 6.3.1.8-Steering of UE in roaming after registration	16.5.0
2020-09	RAN#89	R5-204412	1669	1	F	Correction to NR TC 6.2.2.1-N2L cell reselection	16.5.0
2020-09	RAN#89	R5-204413	1670	1	F	Correction to NR TC 6.2.2.2-L2N cell reselection	16.5.0
2020-09	RAN#89	R5-204414	1677	1	F	Correction to the power level of Idle mode test cases	16.5.0
2020-09	RAN#89	R5-204415	1693	1	F	Corrections to NR5G Idle Mode TC 6.4.2.1	16.5.0
2020-09	RAN#89	R5-204416	1700	1	F	Corrections to NR5G Idle Mode TC 6.1.2.13	16.5.0
2020-09	RAN#89	R5-204417	1722	1	F	Correction to 5G NR Idle mode inter-RAT test cases	16.5.0
2020-09	RAN#89	R5-204418	1613	1	F	Correction to NR TC 7.1.1.9.1-MAC Reset	16.5.0
2020-09	RAN#89	R5-204419	1614	1	F	Correction to NR TC 7.1.1.2.2-PDSCH Aggregation	16.5.0
2020-09	RAN#89	R5-204420	1656	1	F	Correction to NR MAC test case 7.1.1.5.2	16.5.0
2020-09	RAN#89	R5-204421	1694	1	F	Corrections to NR5G MAC TC 7.1.1.2.4	16.5.0
2020-09	RAN#89	R5-204422	1699	1	F	Corrections to NR5G MAC TC 7.1.1.1.2	16.5.0
2020-09	RAN#89	R5-204423	1743	1	F	Addition of NR-DC MAC Test Case	16.5.0
2020-09	RAN#89	R5-204426	1682	1	F	Modification of PDCP TC 7.1.3.5.2 to add testing for change of ul-DataSplitThreshold and transmission of SRs	16.5.0
2020-09	RAN#89	R5-204429	1709	1	F	Correction to NR test case 7.1.3.5.5	16.5.0
2020-09	RAN#89	R5-204430	1724	1	F	Update to test case NR5GC 7.1.3.5.3 (NR-DC)	16.5.0
2020-09	RAN#89	R5-204431	1725	1	F	Correction to NR5GC SDAP test cases 7.1.4.1 and 7.1.4.2	16.5.0
2020-09	RAN#89	R5-204432	1617	1	F	Correction to NR TC 8.1.1.3.3-With priority information	16.5.0
2020-09	RAN#89	R5-204433	1685	1	F	Addition of new RRC TC for checking extended / spare field handling in SI	16.5.0
2020-09	RAN#89	R5-204434	1723	1	F	Correction to NR RRC IRAT test case 8.1.1.3.4	16.5.0
2020-09	RAN#89	R5-204435	1737	1	F	Correction to NR5GC testcase 8.1.1.3.2	16.5.0
2020-09	RAN#89	R5-204436	1745	1	F	Correction to NR5G RRC TC 8.1.1.4.1	16.5.0
2020-09	RAN#89	R5-204437	1619	1	F	Correction to NR TC 8.1.X on SINR related configuration	16.5.0
2020-09	RAN#89	R5-204438	1620	1	F	Correction to NR TC 8.1.3.1.13-CSI-RS based intra-freq	16.5.0
2020-09	RAN#89	R5-204439	1627	1	F	Correction to ENDC TC 8.2.2.6.1-PDCP version change	16.5.0
2020-09	RAN#89	R5-204440	1646	1	F	Correction to NR TC 8.1.3.1.14A-CSI-RS based inter-freq	16.5.0
2020-09	RAN#89	R5-204441	1649	1	F	Addition of new test purpose to test case 8.1.3.1.23	16.5.0
2020-09	RAN#89	R5-204442	1659	1	F	Correction to NR RRC test case 8.1.3.1.20	16.5.0
2020-09	RAN#89	R5-204444	1674	1	F	Correction to NR5GC test case 8.1.3.1.12	16.5.0

2020-09	RAN#89	R5-204445	1675	1	F	Addition of NR-DC RRC test case 8.2.2.8.2	16.5.0
2020-09	RAN#89	R5-204446	1622	1	F	Correction to NR TC 8.1.4.1.7.X-Scell Release	16.5.0
2020-09	RAN#89	R5-204447	1628	1	F	Correction to ENDC TC 8.2.3.9.1-CSI-RS based Intra-frequency measurements	16.5.0
2020-09	RAN#89	R5-204448	1629	1	F	Correction to ENDC TC 8.2.3.10.1-CSI-RS based Inter-frequency measurements	16.5.0
2020-09	RAN#89	R5-204449	1631	1	F	Addition of NRDC TC 8.2.3.16.2-Intra-NR Measurement configuration control and reporting	16.5.0
2020-09	RAN#89	R5-204450	1650	1	F	Correction to include data path check after handover in test case 8.1.4.1.2	16.5.0
2020-09	RAN#89	R5-204451	1672	1	F	Correction to Inter-RAT HO test case 8.1.4.2.2	16.5.0
2020-09	RAN#89	R5-204452	1679	1	F	Correction to Inter-RAT HO test case 8.1.4.2.1	16.5.0
2020-09	RAN#89	R5-204453	1702	1	F	Corrections to NR5G RRC IRAT TC 8.1.4.2.2.1	16.5.0
2020-09	RAN#89	R5-204454	1731	1	F	Addition of NR-DC RRC test case 8.2.3.14.2	16.5.0
2020-09	RAN#89	R5-204455	1742	1	F	Correction to MR-DC RRC TC 8.2.3.8.1	16.5.0
2020-09	RAN#89	R5-204456	1676	1	F	Correction to NR RRC TC 8.1.5.1.1	16.5.0
2020-09	RAN#89	R5-204457	1637	1	F	Correction to NR TC 9.1.1.3-EAP message transport abnormal	16.5.0
2020-09	RAN#89	R5-204458	1638	1	F	Correction to NR TC 9.1.1.6-5G AKA abnormal	16.5.0
2020-09	RAN#89	R5-204459	1716	1	F	Correction to 5GC TC 9.1.3.1	16.5.0
2020-09	RAN#89	R5-204460	1641	1	F	Correction to NR TC 9.1.5.1.9-Initial registration with Change of cell into a new tracking area	16.5.0
2020-09	RAN#89	R5-204461	1642	1	F	Correction to NR TC 9.1.6.1.4-Transmission failure with TAI change from lower layers	16.5.0
2020-09	RAN#89	R5-204462	1706	1	F	Correction to 5GC TC 9.1.5.2.9	16.5.0
2020-09	RAN#89	R5-204463	1752	1	F	Correction to NR TC 9.1.5.1.14	16.5.0
2020-09	RAN#89	R5-204464	1753	1	F	Corrections to NR5G NAS TC 9.1.6.1.3	16.5.0
2020-09	RAN#89	R5-204465	1726	1	F	Correction to Multilayer TC 11.1.2 and 11.1.5	16.5.0
2020-09	RAN#89	R5-204466	1732	1	F	Corrections to EPS Fallback regarding IMS procedures	16.5.0
2020-09	RAN#89	R5-204467	1738	1	F	Correction to test case 11.1.7	16.5.0
2020-09	RAN#89	R5-204468	1643	1	F	Correction to NR TC 11.3.9-UAC AI-0 Operator Defined Access Category	16.5.0
2020-09	RAN#89	R5-204512	1701	1	F	Corrections to NR5G RLC TC 7.1.2.3.11	16.5.0
2020-09	RAN#89	R5-204513	1660	1	F	Addition of new test case 8.1.4.2.1.2 for Inter-RAT handover from NR to EN-DC	16.5.0
2020-09	RAN#89	R5-204517	1658	1	F	Introduction of a new test case for voice fallback indication under EPS Fallback with redirection	16.5.0
2020-09	RAN#89	R5-204518	1747	1	F	Addition of NR5G UAC TC 11.3.2	16.5.0
2020-09	RAN#89	R5-204543	1607	1	F	Correction to NR TC 6.3.1.3-SOR during registration with security check unsuccessful for Automatic mode	16.5.0
2020-12	RAN#90	R5-205142	1758	-	F	Update of test case 9.3.1.2 Inter-system mobility registration update / Single-registration mode with N26 / 5GMM-IDLE / EPC to 5GC	16.6.0
2020-12	RAN#90	R5-205176	1768	-	F	Correction to ENDC TC 8.2.6.2.1	16.6.0
2020-12	RAN#90	R5-205180	1770	-	F	Corrections to TC 8.1.4.2.2 regarding IMS usage	16.6.0
2020-12	RAN#90	R5-205192	1771	-	F	Correction to 5G NR Idle mode test case 6.1.2.14	16.6.0
2020-12	RAN#90	R5-205244	1778	-	F	Correction to the Preamble of Test case 8.1.4.1.2	16.6.0
2020-12	RAN#90	R5-205279	1779	-	F	Correction to NR-DC RRC test case 8.2.3.14.2	16.6.0
2020-12	RAN#90	R5-205292	1783	-	F	Corrections to EPS Fallback test cases regarding IMS usage	16.6.0
2020-12	RAN#90	R5-205320	1787	-	F	Correction to NR5G Idle Mode TC 6.1.1.1	16.6.0
2020-12	RAN#90	R5-205321	1788	-	F	Correction to NR5G UAC TC 11.3.2	16.6.0
2020-12	RAN#90	R5-205341	1790	-	F	Updates to PDCP default Pre-Test Conditions	16.6.0
2020-12	RAN#90	R5-205342	1791	-	F	Corrections to NR CA HO test cases 8.1.4.1.9.x	16.6.0
2020-12	RAN#90	R5-205361	1795	-	F	Correction to Idle Mode SoR Test Case 6.3.1.7	16.6.0
2020-12	RAN#90	R5-205365	1796	-	F	Correction to NR TC 6.1.2.9-Cell reselection using Qhyst and Qoffset	16.6.0
2020-12	RAN#90	R5-205366	1797	-	F	Correction to NR TC 6.1.2.13-Cell reselection CellReservedForOperatorUse with Access Identity 0-1-2-12-13-14	16.6.0
2020-12	RAN#90	R5-205368	1799	-	F	Correction to NR TC 6.3.1.3-SOR security check unsuccessful	16.6.0
2020-12	RAN#90	R5-205369	1800	-	F	Correction to NR TC 6.3.1.5-Steering of UE in roaming during registration	16.6.0
2020-12	RAN#90	R5-205373	1804	-	F	Correction to NR TC 8.1.3.1.11-RSRQ based	16.6.0
2020-12	RAN#90	R5-205374	1805	-	F	Correction to NR TC 8.1.3.2.X-Inter-RAT	16.6.0
2020-12	RAN#90	R5-205377	1808	-	F	Correction to MRDC TC 8.2.2.8.2-key change	16.6.0
2020-12	RAN#90	R5-205379	1810	-	F	Correction to MRDC TC 8.2.3.9.1-CSI-RS based intra-freq	16.6.0
2020-12	RAN#90	R5-205381	1812	-	F	Correction to MRDC TC 8.2.3.16.2-Measurement via SRB3	16.6.0
2020-12	RAN#90	R5-205383	1814	-	F	Correction to NR TC 9.1.4.1-Generic UE configuration update	16.6.0
2020-12	RAN#90	R5-205385	1816	-	F	Correction to NR TC 9.1.6.1.3-DeRegistration	16.6.0
2020-12	RAN#90	R5-205388	1819	-	F	Correction to NR TC 11.3.9-UAC AI-0 Operator Defined Access Category	16.6.0
2020-12	RAN#90	R5-205575	1862	-	F	Correction to NR PDCP test case 7.1.3.5.2 for NR-DC	16.6.0

2020-12	RAN#90	R5-205577	1864	-	F	Correction to ENDC CA RRC test cases 8.2.4.1.1.x	16.6.0
2020-12	RAN#90	R5-205578	1865	-	F	Correction to NR5G MAC TC 7.1.1.8.1	16.6.0
2020-12	RAN#90	R5-205579	1866	-	F	Correction NR5G NAS TC 9.1.1.2	16.6.0
2020-12	RAN#90	R5-205600	1871	-	F	Correction to NR TC 6.4.2.1-Cell Selection in RRC_INACTIVE state	16.6.0
2020-12	RAN#90	R5-205615	1879	-	F	Correction to 5GS Non-3GPP Access Test Case 9.2.4.1	16.6.0
2020-12	RAN#90	R5-205616	1880	-	F	Correction to 5GS Non-3GPP Access Test Case 9.2.5.1.2	16.6.0
2020-12	RAN#90	R5-205637	1882	-	F	Update to TC 7.1.3.5.5 PDCP Duplication	16.6.0
2020-12	RAN#90	R5-205671	1884	-	F	Correction to ENDC RLC TC 7.1.2.3.6	16.6.0
2020-12	RAN#90	R5-205673	1885	-	F	Correction to RLC TCs 7.1.2.3.7 and 7.1.2.3.8	16.6.0
2020-12	RAN#90	R5-205718	1887	-	F	Correction to NR testcases 8.1.3.1.11, 8.1.3.1.12	16.6.0
2020-12	RAN#90	R5-205752	1888	-	F	Correction to NR test case 8.2.2.1.2	16.6.0
2020-12	RAN#90	R5-205753	1889	-	F	Correction to NR test case 8.2.2.2.1	16.6.0
2020-12	RAN#90	R5-205759	1891	-	F	Correction to NR5G RRC TC 8.1.1.4.1	16.6.0
2020-12	RAN#90	R5-205856	1897	-	F	Correction to Inter-RAT Idle mode test case 6.2.1.4	16.6.0
2020-12	RAN#90	R5-205866	1903	-	F	Correction of NR test case 9.1.5.1.8	16.6.0
2020-12	RAN#90	R5-205942	1906	-	F	Update for Flexible PDU-PDN - Test Cases	16.6.0
2020-12	RAN#90	R5-206123	1907	-	F	Corrections to NR MAC Test Case 7.1.1.5.4	16.6.0
2020-12	RAN#90	R5-206265	1912	-	F	Correction of Idle TC 6.2.3.2	16.6.0
2020-12	RAN#90	R5-206280	1815	1	F	Correction to NR TC 9.1.5.2.9-Mobility and periodic registration update	16.6.0
2020-12	RAN#90	R5-206311	1772	1	F	Correction to Idle TC 6.3.1.9	16.6.0
2020-12	RAN#90	R5-206312	1792	1	F	Correction to Cell Reselection Test Case 6.1.2.18	16.6.0
2020-12	RAN#90	R5-206313	1793	1	F	Correction to Cell Reselection Test Case 6.1.2.21	16.6.0
2020-12	RAN#90	R5-206314	1798	1	F	Correction to NR TC 6.3.1.1-SOR	16.6.0
2020-12	RAN#90	R5-206315	1856	1	F	Addition of new NR TC-Additional extended field in LTE SIB1_schedulingInfoList-v12j0	16.6.0
2020-12	RAN#90	R5-206316	1857	1	F	Addition of new NR TC-Additional extended field in LTE SIB1_schedulingInfoListExt-r12	16.6.0
2020-12	RAN#90	R5-206317	1909	1	F	Correction to test case 6.2.3.9	16.6.0
2020-12	RAN#90	R5-206318	1910	1	F	Correction to NR IDLE mode test case 6.1.2.2	16.6.0
2020-12	RAN#90	R5-206319	1801	1	F	Correction to NR TC 7.1.1.5.5-Long DRX command MAC control element reception	16.6.0
2020-12	RAN#90	R5-206320	1802	1	F	Correction to NR TC 7.1.1.9.1-MAC Reset	16.6.0
2020-12	RAN#90	R5-206321	1858	1	F	Correction to MAC TC 7.1.1.8.1	16.6.0
2020-12	RAN#90	R5-206322	1869	1	F	Correction to NR TC 7.1.1.10.1-DatInactivityTimer expiry	16.6.0
2020-12	RAN#90	R5-206323	1892	1	F	Addition of MAC Test Case for Recommended Bit Rate	16.6.0
2020-12	RAN#90	R5-206324	1893	1	F	Corrections to MAC CA Power Headroom Test case	16.6.0
2020-12	RAN#90	R5-206325	1895	1	F	Correction to MAC CA test case	16.6.0
2020-12	RAN#90	R5-206326	1803	1	F	Correction to NR TC 7.1.2.3.3 and 7.1.2.3.4-SN	16.6.0
2020-12	RAN#90	R5-206327	1761	1	F	Correction to NR PDCP test cases 7.1.3.2.x	16.6.0
2020-12	RAN#90	R5-206328	1762	1	F	Correction to NR PDCP test cases 7.1.3.3.x	16.6.0
2020-12	RAN#90	R5-206329	1863	1	F	Correction to NR PDCP test case 7.1.3.5.5 for NR-DC	16.6.0
2020-12	RAN#90	R5-206330	1886	1	F	Update to test case NR5GC 7.1.3.5.3 (NR-DC)	16.6.0
2020-12	RAN#90	R5-206331	1769	1	F	Correction to SDAP testcase 7.1.4.1 and 7.1.4.2	16.6.0
2020-12	RAN#90	R5-206332	1785	1	F	Correction to NR5G RRC TC 8.1.1.3.4	16.6.0
2020-12	RAN#90	R5-206333	1896	1	F	Correction to NR5GC test case 8.1.2.1.4	16.6.0
2020-12	RAN#90	R5-206334	1781	1	F	Correction to RRC TC 8.1.3.1.2	16.6.0
2020-12	RAN#90	R5-206335	1786	1	F	Correction to NR5G RRC TC 8.1.3.1.2, 8.1.3.1.3 and 8.1.3.1.4	16.6.0
2020-12	RAN#90	R5-206336	1900	1	F	Correction to NR5GC test case 8.1.4.1.5	16.6.0
2020-12	RAN#90	R5-206337	1806	1	F	Correction to NR TC 8.1.5.2.2-SI Change in NR RRC_CONNECTED state	16.6.0
2020-12	RAN#90	R5-206338	1807	1	F	Correction to NR TC 8.1.5.7.1-MCG RLC failure	16.6.0
2020-12	RAN#90	R5-206339	1902	1	F	Correction to NR5GC test case 8.1.5.6.1	16.6.0
2020-12	RAN#90	R5-206340	1760	1	F	Correction to ENDC RRC test case 8.2.2.3.1	16.6.0
2020-12	RAN#90	R5-206341	1809	1	F	Correction to MRDC TC 8.2.2.9.2-split DRB	16.6.0
2020-12	RAN#90	R5-206342	1867	1	F	Correction to NRDC TC 8.2.2.4.2 and 8.2.2.5.2	16.6.0
2020-12	RAN#90	R5-206343	1890	1	F	Correction to NR5G RRC TC 8.2.2.1.2	16.6.0
2020-12	RAN#90	R5-206344	1911	1	F	Addition of NR-DC RRC test case 8.2.2.7.2	16.6.0
2020-12	RAN#90	R5-206345	1759	1	F	Correction to ENDC CA RRC test cases 8.2.4.3.1.x	16.6.0
2020-12	RAN#90	R5-206346	1777	1	F	Addition of new Test Case 8.2.5.1.2 Radio link failure / Random access problem / NR-DC	16.6.0
2020-12	RAN#90	R5-206347	1789	1	F	Addition of NRDC TC 8.2.5.2.2	16.6.0
2020-12	RAN#90	R5-206348	1813	1	F	Correction to MRDC TC 8.2.6.1.X-SCG RLC failure	16.6.0
2020-12	RAN#90	R5-206349	1773	1	F	Correction to 5GC TC 9.1.1.3	16.6.0
2020-12	RAN#90	R5-206350	1774	1	F	Correction to 5GC TC 9.1.1.6	16.6.0
2020-12	RAN#90	R5-206351	1766	1	F	Correction to NR5GC testcase 9.1.5.2.1	16.6.0
2020-12	RAN#90	R5-206352	1775	1	F	Correction to 5GC TC 9.1.5.1.3	16.6.0
2020-12	RAN#90	R5-206353	1859	1	F	Update preamble of 5GC TC 9.1.5.1.2, 9.1.5.1.4 and 9.1.5.1.14	16.6.0
2020-12	RAN#90	R5-206354	1868	1	F	Correction to NR5GC testcase 10.1.1.2	16.6.0
2020-12	RAN#90	R5-206355	1767	1	F	Correction to NR5GC testcase 10.1.3.2	16.6.0
2020-12	RAN#90	R5-206356	1872	1	F	Correction to NR5GC testcase 10.1.2.2	16.6.0



2020-12	RAN#90	R5-206357	1873	1	F	Correction to NR5GC testcase 10.1.4.1	16.6.0
2020-12	RAN#90	R5-206358	1874	1	F	Correction to NR5GC testcase 10.1.6.1	16.6.0
2020-12	RAN#90	R5-206359	1875	1	F	Correction to NR5GC testcase 10.1.6.2	16.6.0
2020-12	RAN#90	R5-206360	1776	1	F	Correction to Multilayer TC 11.1.4	16.6.0
2020-12	RAN#90	R5-206361	1817	1	F	Correction to NR TC 11.1.1-MO MMTEL voice call setup from NR RRC_IDLE with EPS Fallback	16.6.0
2020-12	RAN#90	R5-206362	1818	1	F	Correction to NR TC 11.1.3-MO MMTEL voice call setup from NR RRC_CONNECTED with EPS Fallback	16.6.0
2020-12	RAN#90	R5-206363	1784	1	F	Corrections to Unified Access Control test cases regarding IMS usage	16.6.0
2020-12	RAN#90	R5-206364	1794	1	F	Correction to Access Barring test 11.3.4	16.6.0
2020-12	RAN#90	R5-206365	1876	1	F	Correction to Emergency Services testcase 11.4.1	16.6.0
2020-12	RAN#90	R5-206366	1877	1	F	Correction to Emergency Services testcase 11.4.4	16.6.0
2020-12	RAN#90	R5-206396	1820	1	F	Addition of TC for DL assignment Multi Semi-persistent configuration	16.6.0
2020-12	RAN#90	R5-206397	1860	1	F	Addition of TC PDCP Duplication for Rel-16	16.6.0
2020-12	RAN#90	R5-206398	1908	1	F	New testcase for ethernet header compression and decompression for NR	16.6.0
2020-12	RAN#90	R5-206405	1824	1	F	Addition of NR TC 8.1.4.3.1-MobEnh DAPS handover	16.6.0
2020-12	RAN#90	R5-206411	1822	1	F	Addition of NR V2X TC 12.1.2.1.3-Network Scheduling	16.6.0
2020-12	RAN#90	R5-206412	1823	1	F	Addition of NR V2X TC 12.1.2.3.1-C1 and C2	16.6.0
2020-12	RAN#90	R5-206415	1904	1	F	Addition of eMIMO MAC Test Case	16.6.0
2020-12	RAN#90	R5-206417	1780	1	F	Addition of UE power saving test case 7.1.1.12.1	16.6.0
2020-12	RAN#90	R5-206418	1782	1	F	Addition of UE power saving test case 7.1.1.12.3	16.6.0
2020-12	RAN#90	R5-206429	1764	1	F	Update test case 8.1.5.1.1 to add UE capability nr-HO-ToEN-DC-r16	16.6.0
2020-12	RAN#90	R5-206430	1765	1	F	Update of test case 8.2.1.1.1 to support Inter-RAT handover from NR to EN-DC	16.6.0
2020-12	RAN#90	R5-206431	1878	1	F	Correction to 5GS Non-3GPP Access Test Case 9.2.2.1	16.6.0