

## 11.1.4 MO-SMS over SGs / Active mode

### 11.1.4.1 Test Purpose (TP)

(1)

```
with { UE is IMSI attached for non-EPS services and in EMM-CONNECTED mode }
ensure that {
  when { a MO SMS is initiated at the UE }
  then { UE sends a CP-DATA containing an RP-DATA RPDU (SMS SUBMIT TPDU) encapsulated in an Uplink
NAS transport message }
}
```

(2)

```
with { UE is IMSI attached for non-EPS services and in EMM-CONNECTED mode and UE has sent a 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 (SMS SUBMIT REPORT TPDU) encapsulated in a
Downlink NAS transport message }
  then { UE sends a CP-ACK encapsulated in an Uplink NAS Transport message }
}
```

### 11.1.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: 3GPP TS 24.301, clauses 5.6.3.1, 5.6.3.2 and 9.9.3.22, and TS 23.401, clause 5.3.4.1.

[TS 24.301, clause 5.6.3.1]

The purpose of the transport of NAS messages procedure is to carry SMS messages in an encapsulated form between the MME and the UE. The procedure may be initiated by the UE or the network and can only be used when the UE is attached for EPS services and IMSI attached for non-EPS services and is in EMM-CONNECTED mode.

[TS 24.301, clause 5.6.3.2]

Upon request from the SMS entity to send an SMS message, the EMM entity in the UE initiates the procedure by sending an UPLINK NAS TRANSPORT message including the SMS message in the NAS message container IE.

[TS 24.301, clause 9.9.3.22]

This information element is used to encapsulate the SMS messages transferred between the UE and the network. The NAS message container information element is coded as shown in Table 9.9.3.22.1 and 9.9.3.22.2.

The NAS message container is a type 4 information element with a minimum length of 4 octets and a maximum length of 253 octets.

**Table 9.9.3.22.1: NAS message container information element**

8	7	6	5	4	3	2	1	
NAS message container IEI								octet 1
Length of NAS message container contents								octet 2
								octet 3
NAS message container contents								
								octet n

**Table 9.9.3.22.2: NAS message container information element**

NAS message container contents (octet 3 to octet n)
This IE can contain an SMS message (i.e. CP-DATA, CP-ACK or CP-ERROR) as defined in subclause 7.2 in 3GPP TS 24.011 [13A].

...

[TS 23.401, clause 5.3.4]

1. The UE sends NAS message Service Request towards the MME encapsulated in an RRC message to the eNodeB. The RRC message(s) that can be used to carry the S-TMSI and this NAS message are described in TS 36.300 [5].
2. The eNodeB forwards NAS message to MME. NAS message is encapsulated in an S1-AP: Initial UE Message (NAS message, TAI+ECGI of the serving cell, S-TMSI, CSG ID, CSG access Mode). Details of this step are described in TS 36.300 [5]. If the MME can't handle the Service Request it will reject it. CSG ID is provided if the UE attaches via a closed or hybrid mode CSG cell. CSG access mode is provided if the UE sends the Service Request message via a hybrid mode CSG cell. If the CSG access mode is not provided but the CSG ID is provided, the MME shall consider the CSG cell as a closed mode CSG cell.

If a CSG ID is indicated and CSG access mode is "closed" or CSG access mode is not provided, and there is no subscription data for this CSG ID or the CSG subscription is expired, the MME rejects the Service Request with an appropriate cause. The UE shall remove the CSG ID of the cell where the UE has initiated the service request procedure from the Allowed CSG list.

3. NAS authentication procedures may be performed.
4. The MME sends S1-AP Initial Context Setup Request (Serving GW address, S1-TEID(s) (UL), EPS Bearer QoS(s), Security Context, MME Signalling Connection Id, Handover Restriction List) message to the eNodeB. This step activates the radio and S1 bearers for all the active EPS Bearers. The eNodeB stores the Security Context, MME Signalling Connection Id, EPS Bearer QoS(s) and S1-TEID(s) in the UE RAN context. The step is described in detail in TS 36.300 [5]. Handover Restriction List is described in clause 4.3.5.7 "Mobility Restrictions".
5. The eNodeB performs the radio bearer establishment procedure. The user plane security is established at this step, which is described in detail in TS 36.300 [5]. When the user plane radio bearers are setup the Service Request is completed and EPS bearer state is synchronized between the UE and the network, i.e. the UE should remove the EPS bearer for which no radio bearers are setup.

...

#### 11.1.4.3 Test description

##### 11.1.4.3.1 Pre-test conditions

#### System Simulator:

- Cell A is configured according to Table 6.3.2.2-1 in [18].
- Cell A belongs TAI-1.
- Cell A is set to the "Serving cell".

#### UE:

- The UE does not have any stored SMS message.

#### Preamble:

- UE is in state Generic RB Established (state 3) on Cell A according to [18].

## 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	Sending of a 160 character MO 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(SMS SUBMIT REPORT TPDU) encapsulated in an Downlink NAS transport message	<--	DOWNLINK NAS TRANSPORT	-	-
5	Check: Does the UE transmit a CP-ACK encapsulated in an Uplink NAS Transport message?	-->	UPLINK NAS TRANSPORT	2	P

## 11.1.4.3.3 Specific message contents

**Table 11.1.4.3.3-1: Message UPLINK NAS TRANSPORT (step 2, Table 11.1.4.3.2-1)**

Derivation Path: 36.508 clause 4.7.2-27A			
Information Element	Value/remark	Comment	Condition
NAS message container	Set according to Table 11.1.4.3.3-2		

**Table 11.1.4.3.3-2: Message CP-DATA (step 2, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
Protocol discriminator	'1001'B	SMS messages	
Message type	'0000001'B	CP-DATA	
CP-User data	Set according to Table 11.1.4.3.3-3		

**Table 11.1.4.3.3-3: Message RP-DATA RPDU (step 2, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
RP-Message Type	'000'B	RP-DATA uplink	
RP-Message Reference	present		
RP-Originator Address	present	1 octet	
RP-Destination Address	present	1-12 octets	
RP-User Data	Set according to Table 11.1.4.3.3-4		

**Table 11.1.4.3.3-4: Message SMS SUBMIT TPDU (step 2, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
TP-MTI	'01'B	SMS-SUBMIT	
TP-PID	Different from Type 0: "01000000"B		
TP-UDL	160		
TP-UD (140 octets)	text of message (160 characters)		

**Table 11.1.4.3.3-5: Message DOWNLINK NAS TRANSPORT (step 3, Table 11.1.4.3.2-1)**

Derivation Path: 36.508 clause 4.7.2-12A			
Information Element	Value/remark	Comment	Condition
NAS message container	Set according to Table 11.1.4.3.3-6		

**Table 11.1.4.3.3-6: Message CP-ACK (step 3 Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
Protocol discriminator	'1001'B	SMS messages	
Message type	'00000100'B	CP-ACK	

**Table 11.1.4.3.3-7: Message DOWNLINK NAS TRANSPORT (step 4, Table 11.1.4.3.2-1)**

Derivation Path: 36.508 clause 4.7.2-12A			
Information Element	Value/remark	Comment	Condition
NAS message container	Set according to Table 11.1.4.3.3-8		

**Table 11.1.4.3.3-8: Message CP-DATA (step 4, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
Protocol discriminator	'1001'B	SMS messages	
Message type	'00000001'B	CP-DATA	
CP-User data	Set according to Table 11.1.4.3.3-9		

**Table 11.1.4.3.3-9: Message RP-ACK RPDU (step 4, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
RP-Message Type	'01'B	RP-ACK_PDU downlink	
RP-Message Reference	present		
RP-User Data	Set according to Table 11.1.4.3.3-10		

**Table 11.1.4.3.3-10: Message SMS SUBMIT REPORT TPDU (step 4, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
TP-MTI	'01'B	SMS-SUBMIT REPORT	
TP-FCS	Not present		

**Table 11.1.4.3.3-11: Message UPLINK NAS TRANSPORT (step 5, Table 11.1.4.3.2-1)**

Derivation Path: 36.508 clause 4.7.2-27A			
Information Element	Value/remark	Comment	Condition
NAS message container	Set according to Table 11.1.4.3.3-12		

**Table 11.1.4.3.3-12: Message CP-ACK (step 5, Table 11.1.4.3.2-1)**

Information Element	Value/remark	Comment	Condition
Protocol discriminator	'1001'B	SMS messages	
Message type	'00000100'B	CP-ACK	