3GPP TSG-T plenary meeting #21 ***Tdoc TP-030184***
Frankfurt, Germany, 17-19 September 2003

Source: T3

Title: CRs to TS 31.121: UICC-Terminal Interface; Application Test specification

Document for: Approval

This document contains the following change requests:

T3 Doc	Spec	CR	Rev	Rel	Subject	Cat	Version-Current	Version-New
T3-030678	31.121	026	-	R99	Usage of 3G PDU definition for UEs accessing UTRAN	F	3.6.0	3.7.3
T3-030679	31.121	027	-	Rel-4	Usage of 3G PDU definition for UEs accessing UTRAN	F	4.5.0	4.6.0

3GPP TSG-T3 Meeting #28
Marseille, France, 19.08.-22.08.2003

Tdoc ⌘T3-030678

CR-Form-v7

CHANGE REQUEST

⌘ **31.121** **CR** **026** ⌘**rev** **-** ⌘ Current version: **3.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

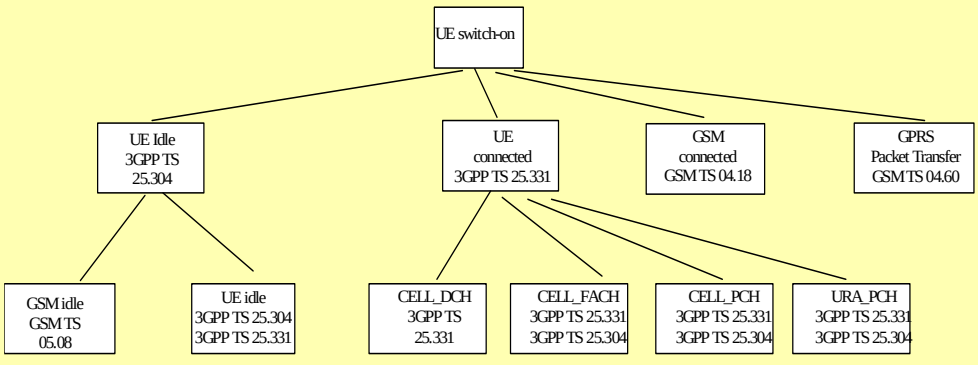
Title:	⌘	Usage of 3G PDU definition for UEs accessing UTRAN
Source:	⌘	T3
Work item code:	⌘	TEI
Date:	⌘	21/08/2003
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘ Several test cases do not cover 3G PDU definition. For a correct set up of the test cases on the Universal System Simulator and conformance with according core specifications like 25.331, it is essential to use the required 3G terminology.

The following figure in 3GPP TS 25.331, ch. 4.1 summarises the mapping of UE states, including states in GSM, to the appropriate UTRA and GSM specifications that specify the UE behaviour.



UICC is not an abbreviation

Summary of change: ⌘ Affected conformance requirements and test procedure have been changed so that 3G functionality is covered. Reference and abbreviations chapters enhanced accordingly.

Abbreviation for UICC deleted

Consequences if not approved:	⌘	The affected tests can not be implemented on any test system in an accurate way, because IMMEDIATE ASSIGNMENT does not exist in 3G.

Clauses affected:	⌘	2, 3.3, 5.1.1.2, 5.1.1.4.2, 5.1.1.5, 5.1.2.2, 5.1.2.4.2, 5.1.3.2, 5.1.3.4.2, 5.1.3.5, 5.1.4.2, 5.1.4.4.2, 5.1.5.2, 5.1.5.4.2, 6.4.2.4.2, 6.4.3.4.2, 6.4.4.4.2, 7.1.1.4.2, 7.1.2.4.2, 7.1.3.4.2, 7.2.2.4.2, 7.2.4.3.2, 7.3.1.4.2, 7.3.2.4.2, 7.4.1.4.2, 7.4.2.4.2			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] ISO/IEC 7816-1 (1998): "Identification cards - Integrated circuit(s) cards with contacts - Part 1: Physical characteristics".

[2] ISO/IEC 7816-6 (1996): "Identification cards - Integrated circuit(s) cards with contacts - Part 6: Interindustry data elements".

[3] 3GPP TS 23.038: "Alphabets and language-specific information".

[4] 3GPP TS 31.102: "Characteristics of the USIM application".

[5] ETSI TS 102 221: "UICC-Terminal interface; Physical and logical characteristics".

[6] 3GPP TS 22.011: "Service accessibility".

[7] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[8] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[9] 3GPP TS 23.086: "Advice of Charge (AoC) Supplementary Service - Stage 2".

[10] 3GPP TS 24.086: "Advice of Charge (AoC) Supplementary Service - Stage 3".

[11] 3GPP TS 22.101: "Service aspects; Service principles".

[12] 3GPP TS 22.030: "Man-Machine Interface (MMI) of the User Equipment (UE)".

[13] 3GPP TS 23.040: " Technical realization of the Short Message Service (SMS)".

[14] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[15] GSM 04.18: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[16] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core Network protocols; Stage 3".

[17] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary service specification; Formats and coding".

[18] 3GPP TS 22.086: "Advice of Charge (AoC) supplementary services; Stage 1".

[19] 3GPP TS 21.111: "USIM and IC card requirements".

[20] 3GPP TS 25.331 "Radio Resource Control (RRC); Protocol Specification "

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	3rd Generation
3GPP	3rd Generation Partnership Project
ACC	ACcess Class

ACL	APN Control List
ACM	Accumulated Call Meter
ACMmax	ACM maximal value
ACT	ACcess Technology
ADF	Application Dedicated File
AoC	Advice of Charge
AoCC	Advice of Charge Charging
APN	Access Point Name
ATR	Answer To Reset
BCCH	Broadcast Control Channel
BCD	Binary Coded Decimal
BDN	Barred Dialling Number
CCI	Capability / Configuration Identifier
CCM	Current Call Meter
CK	Cipher key
DF	Dedicated File
EF	Elementary File
EMMI	Electrical Man Machine Interface
Ext n	Extension n
FDN	Fixed Dialling Number
FPLMN	Forbidden PLMN
GSM	Global System for Mobile communications
HPLMN	Home PLMN
ICC	Integrated Circuit Card
ID	IDentifier
IEC	International Electrotechnical Commission
IK	Integrity key
IMSI	International Mobile Subscriber Identity
ISO	International Organization for Standardization
KSI	Key Set Identifier
LAC	Location Area Code
LAI	Location Area Information
LSB	Least Significant Bit
MCC	Mobile Country Code
MF	Master File
MMI	Man Machine Interface
MNC	Mobile Network Code
MSB	Most Significant Bit
NAS	Non Access Stratum
NPI	Numbering Plan Identifier
OFM	Operational Feature Monitor
OSI	Open System Interconnection
P1	Parameter 1
P2	Parameter 2
P3	Parameter 3
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PS	Packet switched
RACH	Random Access Channel
RRC	Radio Resource Control
RFU	Reserved for Future Use
RPLMN	last Registered PLMN
SS	System Simulator (GSM)
TE	Terminal Equipment
TLV	Tag Length Value
TMSI	Temporary Mobile Subscriber Identity
TON	Type Of Number
UE	User Equipment
~~UICC~~	~~Universal ICC~~
USIM	Universal Subscriber Identity Module
USS	UMTS System Simulator
UTRAN	UMTS Terrestrial Radio Access Network

VPLMN Visitor PLMN

3.5 Generic procedures for UTRAN

If a test case contains the statement "This test applies to Terminals accessing UTRAN", the procedures defined inside 3GPP TS 24.008 [16], subclause 7.2 shall be the basis for all performed procedures during the test. The procedures in subclause 7.2 describe the default behaviour of a conformant UE regarding the specified protocols to be used for UTRAN and the required procedures from the NAS.

5 Subscription related tests

5.1 IMSI / TMSI handling

5.1.1 UE identification by short IMSI

5.1.1.1 Definition and applicability

The IMSI is used for unique identification of the UE by UTRAN. The IMSI is stored in the USIM and read during the UICC-Terminal initialisation procedure.

This test applies to Terminals accessing UTRAN.

5.1.1.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNTMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the IMSI of the USIM which is less than the maximum length.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4;
- TS 102 221, subclause 14.1.1.

5.1.1.3 Test purpose

1) To verify that the Terminal uses the IMSI of the USIM.
2) To verify that the Terminal can handle an IMSI of less than the maximum length.
3) To verify that the READ EF_{IMSI} command is performed correctly by the terminal

5.1.1.4 Method of test

5.1.1.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.

- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is installed into the Terminal and the UE is powered on.

5.1.1.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI stored in the USIM.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.1.5 Acceptance criteria

After step b) the UE shall send PAGING RESPONSE to the USS containing the IMSI stored in the USIM.

5.1.2 UE identification by short IMSI using a 2 digit MNC

5.1.2.1 Definition and applicability

In some networks the IMSI identifying the UTRAN can be consistence of a 2 digit MNC. The IMSI is stored in the USIM and read during the UICC-Terminal initialisation procedure.

This test applies to Terminals accessing UTRAN.

5.1.2.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNTMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the IMSI of the USIM.

Reference:

- TS 31.102, subclause 4.2.18;
- TS 24.008, subclause 10.5.1.4.

5.1.2.3 Test purpose

1) To verify that the Terminal can handle an IMSI consistence of a 2 digit MNC.

5.1.2.4 Method of test

5.1.2.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/81/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{IMSI} (IMSI)

Logically: 246813579

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9
Hex	05	29	64	18	53	97	FF	FF	FF

EF_{AD} (Administrative Data)

Logically: Normal operation
OFM to be deactivated by the Terminal
MNC: 2 digit

Coding:	B1	B2	B3	B4
Hex	00	00	00	02

The UICC is installed into the Terminal and the UE is powered on.

5.1.2.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI stored in the USIM.

b) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.2.5 Acceptance criteria

After step b) the UE shall send PAGING RESPONSE to the USS containing the IMSI stored in the USIM.

5.1.3 UE identification by "short" TMSI

5.1.3.1 Definition and applicability

The TMSI is temporarily used for identification of the UE by UTRAN. It will have been previously assigned by the network. The TMSI is stored in the USIM by the Terminal and read during the USIM-Terminal initialisation procedure.

NOTE: According to TS 23.003, subclause 2.4, a TMSI always consists of 8 digits (4 bytes). With this tests the handling of a TMSI with leading zeros will be tested. The term "short" TMSI is used in order to distinguish between the tests as defined in subclauses 5.1.3 and 5.1.4.

This test applies to Terminals accessing UTRAN.

5.1.3.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the TMSI stored in the USIM. According to subclause 10.3.1.17 in TS 25.331 [20] the TMSI has a fixed length of 32 bits (8 digits) when used inside the PAGING TYPE 1 message.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4.
- TS 25.331, subclause 10.3.1.17

5.1.3.3 Test purpose

1) To verify that the Terminal uses the TMSI stored in the USIM.

2) To verify that the Terminal can handle a TMSI of less than maximum length.

5.1.3.4 Method of test

5.1.3.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{LOCI} (Location Information)

Logically:
LAI-MCC: 246
LAI-MNC: 081
LAI-LAC: 0001
TMSI: "2143"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	00	00	21	43	42	16	80	00	01	FF	00

The UICC is installed into the Terminal and the UE is powered on.

5.1.3.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the TMSI stored in the USIM matching the required length of 8 digits.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.3.5 Acceptance criteria

After step b) the UE shall send PAGING RESPONSE to the USS containing the TMSI stored in the USIM.

5.1.4 UE identification by "long" TMSI

5.1.4.1 Definition and applicability

The TMSI is temporarily used for identification of the UE by UTRAN. It will have been previously assigned by the network. The TMSI is stored in the USIM by the Terminal and read during the USIM-Terminal initialisation procedure.

NOTE: According to TS 23.003, subclause 2.4, a TMSI always consists of 8 digits (4 bytes). With this tests the handling of a new assigned TMSI will be tested. The term "long" TMSI is used in order to distinguish between the tests as defined in subclauses 5.1.3 and 5.1.4.This test applies to Terminals accessing UTRAN.

5.1.4.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the correct TMSI stored in the USIM.

According to subclause 10.3.1.17 in TS 25.331 [20] the TMSI has a fixed length of 32 bits (8 digits) when used inside the PAGING TYPE 1 message.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4.
- TS 25.331, subclause 10.3.1.17

5.1.4.3 Test purpose

1) To verify that the Terminal uses the TMSI stored in the USIM.
2) To verify that the Terminal can handle a TMSI of maximum length.
3) To verify that the Terminal does not respond to page requests containing a previous TMSI.

5.1.4.4 Method of test

5.1.4.4.1 Initial conditions

Prior to this test, the Terminal shall have been operated with a USIM containing TMSI "2143". This may be achieved by executing the previous test (5.1.3) prior to this test. Only under this condition will test purpose 3) be verified.

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{LOCI} (Location Information)

Logically:
LAI-MCC: 246
LAI-MNC: 081
LAI-LAC: 0001
TMSI: "21430000"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	21	43	00	00	42	16	80	00	01	FF	00

The UICC is installed into the Terminal and the UE is powered on.

5.1.4.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the TMSI "0000~~2~~143".

b) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the TMSI stored in the USIM.

c) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

d) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.4.5 Acceptance criteria

1) After step a) the UE shall not respond to the PAGING REQUEST.

2) After step c) the UE shall send PAGING RESPONSE to the USS containing the TMSI stored in the USIM.

5.1.5 UE identification by long IMSI, TMSI updating and key set identifier assignment

5.1.5.1 Definition and applicability

The IMSI and TMSI are used for identification of the UE by UTRAN. They are read from the USIM during the USIM-Terminal initialisation procedure. Within the authentication procedure the network sends a key set identifier to the UE. In addition the network may allocate a new TMSI to the UE. Key set identifier and TMSI are stored in the USIM after call termination and/or at a 3G session termination.

This test applies to Terminals accessing UTRAN.

NOTE: According to TS 24.008 [16] the term KSI may be used instead of the term ciphering key sequence number which is used inside the MM message AUTHENTICATION REQUEST.

5.1.5.2 Conformance requirement

1) After successful completion of the RRC Connection Establishment procedure~~On the receipt of an IMMEDIATE ASSIGNMENT message,~~ the UE shall send PAGING RESPONSE containing the correct IMSI stored in the USIM.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4.

2) After call termination the USIM shall contain the key set identifier (ciphering key sequence number) and TMSI received by the UE during the authentication and TMSI reallocation procedures.

Reference:

- TS 31.102, subclauses 5.1.2, 5.2.5 and 5.2.6;
- TS 21.111 subclause 10.1.
- TS 24.008 subclause 4.3.2.4.

3) After call termination the Terminal shall have updated EFLOCI.

Reference:

- TS 102 221, subclause 14.1.2.

5.1.5.3 Test purpose

1) To verify that the Terminal uses the IMSI stored in the USIM.

2) To verify that the Terminal does not respond to page requests containing a previous IMSI.

3) To verify that the Terminal can handle an IMSI of maximum length.

4) To verify that the Terminal correctly updates the key set identifier at call termination.

5) To verify that the Terminal correctly updates the TMSI at call termination.

6) To verify that the UPDATE EF_{LOCI} command is performed correctly by the terminal.

5.1.5.4 Method of test

5.1.5.4.1 Initial conditions

Prior to this test, the Terminal shall have been operated with a USIM containing IMSI "2460813579". This may be achieved by executing the previous test (5.1.4) prior to this test. Only under this condition will test purpose 2) be verified.

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{IMSI} (IMSI)

Logically: 246081111111111

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9
Hex	08	29	64	80	11	11	11	11	11

The UICC is installed into the Terminal and the UE is powered on.

5.1.5.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI "2460813579".

b) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI stored in the USIM.

c) After receipt of a RRC CONNECTION~~CHANNEL~~ REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

d) After receipt of a PAGING RESPONSE from the UE, the USS sends AUTHENTICATION REQUEST to the UE containing Key Set Identifier KSI (ciphering key sequence number) set to binary 010.

e) After receipt of AUTHENTICATION RESPONSE from the UE, the USS sends TMSI REALLOCATION COMMAND to the UE containing TMSI "32547698".

f) Within 5 s after receipt of TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE.

g) To allow examination of the values in the USIM after call termination the UE shall not be soft powered down. If the test is performed with a USIM simulator, the simulation is stopped. If the test is performed with a USIM, the UICC is removed without soft powering down the UE. If this is not possible, the power supply of the Terminal is removed and then the UICC removed.

5.1.5.5 Acceptance criteria

1) After step a) the UE shall not respond to the PAGING TYPE 1.~~REQUEST~~.

2) After step c) the UE shall send PAGING RESPONSE to the USS containing the IMSI stored in the USIM.

3) After step e) the UE shall send TMSI REALLOCATION COMPLETE to the USS.

4) After step g) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 246
LAI-MNC: 081
TMSI: "32547698"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	32	54	76	98	42	16	80	xx	xx	xx	00

EF_{Keys} (Ciphering and Integrity Keys)

Logically: Key Set Identifier KSI: 02
Ciphering Keys CK: xx (result of the authentication algorithm)
Integrity Keys IK: xx (result of the authentication algorithm)

Coding:	B1	B2	B3	...	B16	B17	B18	...	B31	B32	B33
Hex	02	xx	xx	...	xx	xx	xx	...	xx	xx	xx

6.4 Advice of charge (AoC) handling

[..]

6.4.2 Maximum frequency of ACM updating

6.4.2.1 Definition and applicability

The ACM shall be updated at the end of every interval, where the interval length is given by parameter e2. The Terminal shall update the ACM not more frequently than once every 5 s, even if the interval is less than 5 s. More frequent updating may affect the USIMs read/write cycles.

This test applies to Terminals accessing UTRAN. Besides of that, this test is applicable only to those Terminals supporting AoCC.

6.4.2.2 Conformance requirement

The ACM shall be incremented when the CCM is incremented or once every 5 s, whichever is the longer period.

Reference:

- TS 22.024, subclause 4.3, part h.

6.4.2.3 Test purpose

To verify that the interval between increments is 5 s.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

The Terminal shall be connected to the USIM simulator, with all elementary files coded as default with the exception of:

EF_{UST} (USIM Service Table)

Logically: Local Phone Book available.
User controlled PLMN selector available.

Fixed dialling numbers available.
The GSM Access available.
The Group Identifier level 1 and level 2 not available.
AoC available.
Service n 33 (Packed Switched Domain) shall be set to '1'.

Coding:	B1	B2	B3	B4	B5
binary	xxxx xx11	xxx1 xxxx	xxxx 1x00	xxxx x1xx	xxxx xxx1

The coding of EF_{UST} shall conform with the capabilities of the USIM used.

EF_{ACM} (Accumulated call meter)

Logically: 50 units

EF_{ACMmax} (Accumulated call meter maximum)

Logically: 150 units

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

User Equipment:

- The UE is in MM-state "idle, updated".

6.4.2.4.2 Procedure

a) The UE is made to initiate a call. The call establishment shall be performed according to the procedures defined in TS 24.008 [16], subclause 7.2.3.2.3 extended by the messages of the AoCC. The call is established with AoCC e-parameters sent in a Facility IE in the CONNECT message, as given below. The UE returns the AoCC acknowledgement within 1 s of the CONNECT message. It is an implementation option whether the AoCC acknowledge is sent by the UE before or after the CONNECT ACKNOWLEDGE.

b) The call is maintained for 90 s, then terminated by the USS. During the call, the USIM-simulator monitors the time intervals between successive INCREMENT commands.

Maximum Duration of Test:

2 minutes.

Expected Sequence:

Step	Direction	Message	Comments
1	UE		The UE is made to initiate a call
2	UE -> USS	~~CHANNEL~~ RRC CONNECTION REQUEST	
3	USS -> UE	~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP	
4	UE -> USS	RRC CONNECTION SETUP COMPLETE	
5~~4~~	UE -> USS	CM SERVICE REQUEST	
6	USS -> UE	AUTHENTICATION REQUEST	MM procedure, to ensure the successful start of integrity in step 8
7	UE -> USS	AUTHENTICATION RESPONSE	
8	USS -> UE	SECURITY MODE COMMAND	RRC procedure, start of integrity is mandatory during call setup
9	UE -> USS	SECURITY MODE COMPLETE	
~~5~~	~~USS -> UE~~	~~CM SERVICE ACCEPT~~	
10~~6~~	UE -> USS	SETUP	
11~~7~~	USS -> UE	CALL PROCEEDING	
12~~8~~	USS -> UE	~~ASSIGNMENT COMMAND~~RADIO BEARER SETUP	To a supported channel type
13~~9~~	UE -> USS	~~ASSIGNMENT~~ RADIO BEARER SETUP COMPLETE	
~~10~~14	USS -> UE	ALERTING	
~~11~~15	USS -> UE	CONNECT	As default message except contains Facility IE with contents as indicated in i) below
			Either A or B branch is taken
A16~~2~~	UE -> USS	CONNECT ACKNOWLEDGE	
A17~~3~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B16~~2~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B17~~3~~	UE -> USS	CONNECT ACKNOWLEDGE	
18~~4~~			call duration 90 s after CAI information sent by USS,
19~~5~~	USS -> UE	DISCONNECT	
20~~16~~	UE -> USS	RELEASE	
21~~7~~	USS -> UE	RELEASE COMPLETE	
22~~18~~	USS -> UE	~~CHANNEL~~ RRC CONNECTION RELEASE	~~The main signalling link is~~All connections of RRC are released.
23	UE -> USS	RRC CONNECTION RELEASE COMPLETE	

Specific Message Contents:

i) **FACILITY Information Element** with **Invoke = ForwardChargeInformation** component type as defined in TS 24.080 subclauses 3.6.1 table 3.3.

For ASN.1 description see default message contents in subclause 31.6.1.3.

The values of the e-parameters within the parameter part of the Facility Information Element shall be set as below:

e-parameters:

parameter:	e1	e2	e3	e4	e5	e6	e7
value	1	1	1	0	0	0	0

Values shown in table are in the format and have units as in TS 22.024 clause 3.

ii) **FACILITY Information Element** with **Return Result** component type as defined in TS 24.080 subclause 3.6.1 table 3.4.

For ASN.1 description see default message contents in subclause 31.6.1.3.

6.4.2.5 Acceptance criteria

The UE shall send INCREMENT commands to the USIM every 5 s.

6.4.3 Call terminated when ACM greater than ACMmax

6.4.3.1 Definition and applicability

ACMmax gives the maximum value of ACM, at which the current chargeable calls shall be terminated and no further calls may be made (except emergency calls).

This test applies to Terminals accessing UTRAN. Besides of that, this test is applicable only to those Terminals supporting AoCC.

6.4.3.2 Conformance requirement

ACM shall be incremented by the value of CCM.

If the ACMmax is valid, and the ACM becomes equal to or exceeds the value of the ACMmax, then all calls in progress, chargeable to the user, shall be terminated by the UE, once the chargeable interval determined by the CAI has elapsed, (except emergency calls).

Reference:

- TS 22.024, subclauses 4.2.2 and 4.3 (part h);
- TS 102 221, subclause 14.1.3.

6.4.3.3 Test purpose

1) To verify that the Terminal increments the ACM by the correct number of units, even though this may take ACM above ACMmax.
2) To verify that the Terminal terminates the call.
3) To verify that the INCREMENT EF_{ACM} command is performed correctly by the terminal.

6.4.3.4 Method of test

6.4.3.4.1 Initial conditions

The Terminal shall be connected to a UICC or the USIM simulator, with all elementary files coded as default with the exception of:

EF_{UST} (USIM Service Table)

Logically: Local Phone Book available;
User controlled PLMN selector available;
Fixed dialling numbers available;
The GSM Access available;
The Group Identifier level 1 and level 2 not available;
AoC available;
Service n 33 (Packed Switched Domain) shall be set to '1'.

Coding:	B1	B2	B3	B4	B5
binary	xxxx xx11	xxx1 xxxx	xxxx 1x00	xxxx x1xx	xxxx xxx1

The coding of EF_{UST} shall conform with the capabilities of the USIM used.

EF_{ACM} (Accumulated call meter)

Logically: 80 units

Coding:	B1	B2	B3
binary	0000 0000	0000 0000	0101 0000

EF_{ACMmax} (Accumulated call meter maximum)

Logically: 94 units

Coding:	B1	B2	B3
binary	0000 0000	0000 0000	0101 1110

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

User Equipment:

The UE is in MM-state "idle, updated".

6.4.3.4.2 Procedure

a) The UE is made to initiate a call. The call establishment shall be performed according to the procedures defined in TS 24.008 [16], subclause 7.2.3.2.3 extended by the messages of the AoCC. The call is established with AoCC e-parameters sent in a Facility IE in the CONNECT message, as given below. The UE returns the AoCC acknowledgement within 1 s of the CONNECT message. It is an implementation option whether the AoCC acknowledge is sent by the UE before or after the CONNECT ACKNOWLEDGE.

b) The call is maintained until cleared by the UE (after 30 s).

c) The contents of ACM are checked.

Maximum Duration of Test:

2 minutes.

Expected Sequence:

Step	Direction	Message	Comments
1	UE		The UE is made to initiate a call
2	UE -> USS	~~CHANNEL~~ RRC CONNECTION REQUEST	
3	USS -> UE	~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP	
4	UE -> USS	RRC CONNECTION SETUP COMPLETE	
~~4~~5	UE -> USS	CM SERVICE REQUEST	
6	USS -> UE	AUTHENTICATION REQUEST	MM procedure, to ensure the successful start of integrity in step 8
7	UE -> USS	AUTHENTICATION RESPONSE	
8	USS -> UE	SECURITY MODE COMMAND	RRC procedure, start of integrity is mandatory during call setup
9	UE -> USS	SECURITY MODE COMPLETE	
~~5~~	~~USS -> UE~~	~~CM SERVICE ACCEPT~~	
10~~6~~	UE -> USS	SETUP	
11~~7~~	USS -> UE	CALL PROCEEDING	
~~8~~12	USS -> UE	RADIO BEARER SETUP~~ASSIGNMENT COMMAND~~	To a supported channel type
~~9~~13	UE -> USS	RADIO BEARER SETUP COMPLETE~~ASSIGNMENT COMPLETE~~	
14~~10~~	USS -> UE	ALERTING	
~~11~~15	USS -> UE	CONNECT	As default message except contains Facility IE with contents as indicated in i) below
			Either A or B branch is taken
A16~~2~~	UE -> USS	CONNECT ACKNOWLEDGE	
A17~~3~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B16~~2~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B17~~3~~	UE -> USS	CONNECT ACKNOWLEDGE	
18~~4~~			call duration 30 s after CAI information sent by USS
19~~5~~	UE -> USS	DISCONNECT	
20~~16~~	USS -> UE	RELEASE	
21~~17~~	UE -> USS	RELEASE COMPLETE	
22~~18~~	UE -> USS	~~CHANNEL~~ RRC CONNECTION RELEASE	All connections of RRC are released.~~The main signalling link is released.~~
23	UE -> USS	RRC CONNECTION RELEASE COMPLETE	

Specific Message Contents:

i) **FACILITY Information Element** with **Invoke = ForwardChargeInformation** component type as defined in TS 24.080 subclause 3.6.1 table 3.3.

For ASN.1 description see default message contents in subclause 31.6.1.3.

The values of the e-parameters within the parameter part of the Facility Information Element shall be set as below:

e-parameters:

parameter:	e1	e2	e3	e4	e5	e6	e7
value	10	10	1	0	0	0	0

Values shown in table are in the format and have units as in TS 22.024 clause 3.

ii) FACILITY Information Element with **Return Result** component type as defined in TS 24.080 subclause 3.6.1 table 3.4.

For ASN.1 description see default message contents in subclause 31.6.1.3.

6.4.3.5 Acceptance criteria

1) The UE shall terminate the call correctly 30 s after CAI was sent.

2) The value of ACM shall be 100 units.

6.4.4 Response codes of increase command of ACM

6.4.4.1 Definition and applicability

ACM has a maximum value in terms of coding, and an attempt by the Terminal to exceed that value by sending an INCREASE command shall result in an error message from the USIM. As the maximum of the ACM is equal to the maximum value of ACMmax, all current chargeable calls shall be terminated and no further calls may be made (except emergency calls).

This test applies to Terminals accessing UTRAN. Besides of that, this test is applicable only to those Terminals supporting AoCC.

6.4.4.2 Conformance requirement

The Terminal shall perform the increasing procedure, sending the amount to be increased.

The running accumulated charge shall be stored in the ACM of the USIM.

Where this charge cannot be stored in the UE, use of the telecommunications service shall be prevented.

At the time ACM exceeds it's maximum value, then all calls in progress, chargeable to the user, shall be terminated by the UE, once the chargeable interval determined by the CAI has elapsed, (except emergency calls).

References:

- TS 31.102, subclause 5.3.4;
- TS 22.086, subclauses 2.1 and 2.2.1.

6.4.4.3 Test purpose

To verify that the Terminal clears a charged call if the USIM indicates that the ACM cannot be increased.

6.4.4.4 Method of test

6.4.4.4.1 Initial conditions

The Terminal shall be connected to the USIM simulator, with all elementary files coded as default with the exception of:

EF_{UST} (USIM Service Table)

Logically: Local Phone Book available;
User controlled PLMN selector available;
Fixed dialling numbers available;
The GSM Access available;
The Group Identifier level 1 and level 2 not available;
AoC available;
Service n 33 (Packed Switched Domain) shall be set to '1'.

Coding:	B1	B2	B3	B4	B5
binary	xxxx xx11	xxx1 xxxx	xxxx 1x00	xxxx x1xx	xxxx xxx1

The coding of EF_{UST} shall conform with the capabilities of the USIM used.

EF_{ACM} (Accumulated call meter)

Logically: (Maximum value - 10) units

Coding:	B1	B2	B3
binary	1111 1111	1111 1111	1111 0101

EF_{ACMmax} (Accumulated call meter maximum)

Logically: (Maximum value - 2) units

Coding:	B1	B2	B3
binary	1111 1111	1111 1111	1111 1101

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

User Equipment:

The UE is in MM-state "idle, updated".

6.4.4.4.2 Procedure

a) The UE is made to initiate a call. The call establishment shall be performed according to the procedures defined in TS 24.008 [16], subclause 7.2.3.2.3 extended by the messages of the AoCC. The call is established with AoCC e-parameters sent in a Facility IE in the CONNECT message, as given below. The UE returns the AoCC acknowledgement within 1 s of the CONNECT message. It is an implementation option whether the AoCC acknowledge is sent by the UE before or after the CONNECT ACKNOWLEDGE.

b) After an interval has elapsed, the Terminal increments the ACM. When an INCREASE command is received, the USIM-simulator sends back the error "98 50".

c) Conditions are reset to those described in the initial conditions. Steps a) and b) of the test are repeated, except that the error code sent by the USIM simulator at step b) is now "6F xx".

d) Conditions are reset to those described in the initial conditions. Steps a) and b) of the test are repeated, except that the error code sent by the USIM simulator at step b) is now "65 81".

References:

- TS 102 221, subclause 10.2.1.

Maximum Duration of Test:

3 minutes.

Expected Sequence:

Step	Direction	Message	Comments
1	UE		The UE is made to initiate a call
2	UE -> USS	~~CHANNEL~~ RRC CONNECTION REQUEST	
3	USS -> UE	~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP	
4	UE -> USS	RRC CONNECTION SETUP COMPLETE	
~~4~~5	UE -> USS	CM SERVICE REQUEST	
6	USS -> UE	AUTHENTICATION REQUEST	MM procedure, to ensure the successful start of integrity in step 8
7	UE -> USS	AUTHENTICATION RESPONSE	
8	USS -> UE	SECURITY MODE COMMAND	RRC procedure, start of integrity is mandatory during call setup
9	UE -> USS	SECURITY MODE COMPLETE	
~~5~~	~~USS -> UE~~	~~CM SERVICE ACCEPT~~	
10~~6~~	UE -> USS	SETUP	
11~~7~~	USS -> UE	CALL PROCEEDING	
12~~8~~	USS -> UE	RADIO BEARER SETUP~~ASSIGNMENT COMMAND~~	to a supported channel type
13~~9~~	UE -> USS	RADIO BEARER SETUP COMPLETE~~ASSIGNMENT COMPLETE~~	
14~~0~~	USS -> UE	ALERTING	
15~~1~~	USS -> UE	CONNECT	As default message except contains Facility IE with contents as indicated in i) below
			Either A or B branch is taken
A16~~2~~	UE -> USS	CONNECT ACKNOWLEDGE	
A17~~3~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B16~~2~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B17~~3~~	UE -> USS	CONNECT ACKNOWLEDGE	
18~~4~~			call duration 10s after CAI information sent by USS
19~~5~~	UE -> USS	DISCONNECT	
20~~16~~	USS -> UE	RELEASE	
21~~17~~	UE -> USS	RELEASE COMPLETE	
22~~18~~	UE -> USS	~~CHANNEL~~RRC CONNECTION RELEASE	All connections of RRC are released.~~The main signalling link is released.~~
23~~0~~	UE -> USS	RRC CONNECTION RELEASE COMPLETE	

Specific Message Contents:

i) **FACILITY Information Element** with **Invoke = ForwardChargeInformation** component type as defined in TS 24.080 subclause 3.6.1 table 3.3.

The values of the e-parameters within the parameter part of the Facility Information Element shall be set as below:

e-parameters:

parameter:	e1	e2	e3	e4	e5	e6	e7
value	20	10	1	0	0	0	0

Values shown in table are in the format and have units as in TS 22.024 clause 3.

ii) **FACILITY Information Element** with **Return Result** component type as defined in TS 24.080 subclause 3.6.1 table 3.4.

6.4.4.5 Acceptance criteria

1) The UE shall terminate the call correctly 10 s after CAI was sent.

2) In each of the three cases, as described in steps b), c) and d) of the procedure, the UE shall terminate the call correctly when it receives an indication from the USIM that the ACM cannot be incremented.

7 PLMN related tests

7.1 FPLMN handling

7.1.1 Adding FPLMN to the Forbidden PLMN list

7.1.1.1 Definition and applicability

A list of forbidden PLMNs stored in the USIM and providing storage for at least 4 entries is managed by the UE. In automatic PLMN selection mode the UE controls location updating attempts to appropriate networks with respect to this list of forbidden PLMNs. As a result of a location update reject with the cause "PLMN not allowed" the UE stores the PLMN which rejected the update request in the USIM.

After a location update, which is not followed by an authentication procedure, the Key Set Identifier indicates that the Key Set Identifier is undefined.

NOTE: According to TS 24.008 [16] the term KSI may be used instead of the term ciphering key sequence number which is used inside the MM message AUTHENTICATION REQUEST.

This test applies to Terminals accessing UTRAN.

7.1.1.2 Conformance requirement

1) In automatic PLMN selection mode the UE shall only attempt a LOCATION UPDATE if it receives a BCCH containing a LAI that is not indicated in the EF_{FPLMN} in the USIM.

Reference:

- TS 22.011, subclause 2.3;
- TS 31.102, subclauses 5.1.1 and 5.2.7.

2) After receipt of a LOCATION UPDATE REJECT message with the cause "PLMN not allowed" the Terminal shall update the EF_{FPLMN} in the USIM.

Reference:

- TS 22.011, subclause 2.3;
- TS 31.102, subclauses 5.1.1 and 5.2.7.

3) After call termination the USIM shall contain the correct Key Set Identifier.

Reference:

- TS 31.102, subclauses 5.1.2, 5.2.5 and 5.2.6;
- TS 21.111, subclause 10.1.

4) After call termination the USIM shall contain the correct TMSI and location information received by the UE.

Reference:

- TS 31.102, subclauses 5.1.2, 5.2.5 and 5.2.6;
- TS 21.111, subclause 10.1.

7.1.1.3 Test purpose

1) To verify that in automatic PLMN selection mode the UE does not attempt to access PLMNs stored in EF_{FPLMN} on the USIM.

2) To verify that the EF_{FPLMN} is correctly updated by the Terminal after receipt of a LOCATION UPDATE REJECT message with cause "PLMN not allowed".

3) To verify that the EF_{Keys} has been correctly updated by the Terminal.

4) To verify that the EF_{LOCI} has been correctly updated by the Terminal.

7.1.1.4 Method of test

[..]

7.1.1.4.2 Procedure

a) The UE is powered on.

b) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/003

The USS then resumes RF output on the BCCH.

c) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/004

The USS then resumes RF output on the BCCH.

d) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/005

The USS then resumes RF output on the BCCH.

e) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/007

The USS then resumes RF output on the BCCH.

f) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

g) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE REJECT to the UE with cause "PLMN Not Allowed", followed by ~~CHANNEL~~ RRC CONNECTION RELEASE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/008

The USS then resumes RF output on the BCCH.

h) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

i) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 234/008

TMSI: "43658709"

to the UE.

j) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS~~CHANNEL RELEASE to the UE~~.

k) The UE is soft powered down.

7.1.1.5 Acceptance criteria

1) After each of the steps a) to d) the UE shall not attempt a LOCATION UPDATE.

2) After step f) the UE shall send LOCATION UPDATE REQUEST to the USS.

3) After step h) the UE shall send LOCATION UPDATE REQUEST to the USS.

4) After step i) the UE shall respond with TMSI REALLOCATION COMPLETE.

5) After step k) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 234
LAI-MNC: 008
TMSI: "43658709"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	43	65	87	09	32	84	00	xx	xx	xx	00

EF_{Keys} (Ciphering and Integrity Keys)

Logically: Key Set Identifier KSI: 07 (not available)
Ciphering Keys CK: xx
Integrity Keys IK: xx

Coding:	B1	B2	B3	...	B16	B17	B18	...	B31	B32	B33
Hex	07	xx	xx	...	xx	xx	xx	...	xx	xx	xx

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: 234 002 (MCC MNC)
PLMN2: 234 003
PLMN3: 234 004
PLMN4: 234 005
PLMN5: 234 006
PLMN6: 234 007

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	24	00	32	34	00	32	44	00	32	54	00
	B13	B14	B15	B16	B17	B18						
	32	64	00	32	74	00						

7.1.2 UE updating forbidden PLMNs

7.1.2.1 Definition and applicability

A list of forbidden PLMNs stored in the USIM provides storage for at least 4 entries, and is managed by the UE. In automatic PLMN selection mode the UE controls location updating attempts to appropriate networks with respect to this list of forbidden PLMNs. As a result of a location update reject with the cause "PLMN not allowed" the UE stores the PLMN which rejected the update request in the USIM.

This test applies to Terminals accessing UTRAN.

7.1.2.2 Conformance requirement

After the receipt of a LOCATION UPDATE REJECT message with the cause "PLMN not allowed" the UE shall update the EF_{FPLMN} in the USIM.

Reference:

- TS 22.011, subclause 3.2.2.4.

7.1.2.3 Test purpose

To verify that the UE correctly updates the EF_{FPLMN}, i.e. fill up existing gaps in the elementary file before overwriting any existing entries.

7.1.2.4 Method of test

7.1.2.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 234/002/0001.

-Access control: unrestricted.

The default UICC is used with the following exception:

EF_{FPLMN} (Forbidden PLMNs)

Logically:	PLMN1:	234 001 (MCC MNC)
	PLMN2:	empty
	PLMN3:	234 003
	PLMN4:	234 004
	PLMN5:	234 005
	PLMN6:	234 006

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	14	00	FF	FF	FF	32	34	00	32	44	00
	B13	B14	B15	B16	B17	B18						
	32	54	00	32	64	00						

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.1.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE REJECT to the UE with the cause "PLMN not allowed", followed by ~~CHANNEL~~ RRC CONNECTION RELEASE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

d) The UE is soft powered down.

7.1.2.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST to the USS.

2) After step d) the USIM shall contain:

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: 234 001 (MCC MNC)
PLMN2: 234 002
PLMN3: 234 003
PLMN4: 234 004
PLMN5: 234 005
PLMN6: 234 006

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	14	00	32	24	00	32	34	00	32	44	00

	B13	B14	B15	B16	B17	B18
	32	54	00	32	64	00

or

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: 234 001 (MCC MNC)
PLMN2: 234 003
PLMN3: 234 004
PLMN4: 234 005
PLMN5: 234 006
PLMN6: 234 002

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	14	00	32	34	00	32	44	00	32	54	00

	B13	B14	B15	B16	B17	B18
	32	64	00	32	24	00

7.1.3 UE deleting forbidden PLMNs

7.1.3.1 Definition and applicability

In manual PLMN selection mode the UE allows location update attempts to all available PLMNs, including forbidden PLMNs (as indicated by the forbidden PLMN list on the USIM). As a result of a successful location update procedure onto a PLMN which is in the forbidden PLMN list, the forbidden PLMN list is automatically updated by the UE.

This test applies to Terminals accessing UTRAN.

7.1.3.2 Conformance requirement

1) In manual PLMN selection mode the UE shall be able to perform a LOCATION UPDATE attempt to a PLMN which is in the forbidden PLMN list.

   - TS 22.011, subclause 3.2.2.2.

2) After receipt of LOCATION UPDATE ACCEPT the UE shall delete the forbidden PLMN from the forbidden PLMN list.

   - TS 22.011, subclause 3.2.2.4.

7.1.3.3 Test purpose

1) To verify that the UE is able to perform a LOCATION UPDATE on a forbidden PLMN in manual PLMN selection mode.

2) To verify that the UE after a successful LOCATION UPDATE deletes the PLMN in the EF_{FPLMN} on the USIM.

7.1.3.4 Method of test

7.1.3.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 234/005/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{FPLMN} (Forbidden PLMNs)

Logically:	PLMN1:	empty
	PLMN2:	empty
	PLMN3:	empty
	PLMN4:	empty
	PLMN5:	234 005 (MCC MNC)
	PLMN6:	empty

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

B13	B14	B15	B16	B17	B18
32	54	00	FF	FF	FF

The UICC is installed into the Terminal and the UE is set to manual PLMN selection mode.

7.1.3.4.2 Procedure

a) The UE is powered on.

b) PLMN with MCC/MNC of 234/005 is manually selected.

c) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

d) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 234/005

TMSI: "12345678"

to the UE.

e) After receipt of TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

f) The UE is soft powered down.

7.1.3.5 Acceptance criteria

1) After step c) the UE shall send LOCATION UPDATE REQUEST to the USS.

2) After step d) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step f) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 234
LAI-MNC: 005
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	32	54	00	xx	xx	xx	00

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: empty
PLMN2: empty
PLMN3: empty
PLMN4: empty
PLMN5: empty
PLMN6: empty

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

	B13	B14	B15	B16	B17	B18
	FF	FF	FF	FF	FF	FF

7.2 User controlled PLMN selector handling

[..]

7.2.2 UE recognising the priority order of the User controlled PLMN selector list with the same access technology.

7.2.2.1 Definition and applicability

The User controlled PLMN selector list gives in priority order the preferred UPLMNs on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{PLMNwACT}$. Update and deletion of UPLMNs may be performed by the subscriber by the use of the PIN.

This test applies to Terminals accessing UTRAN.

7.2.2.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority order of the UPLMNs in the preferred list on the USIM.

- TS 22.011, subclause 3.2.2.

7.2.2.3 Test purpose

To verify that the UPLMN with the higher priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the UPLMN with the lower priority when the UE performs a network selection.

7.2.2.4 Method of test

7.2.2.4.1 Initial conditions

The USS transmits on two BCCHs, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/033/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/034/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{PLMNwACT}$ (UPLMN Selector with Access Technology)

Logically:	1st PLMN:	244 081 (MCC MNC)
	1st ACT:	UTRAN
	2nd PLMN:	244 081
	2nd ACT	GSM
	3rd PLMN:	244 082
	3rd ACT	UTRAN
	3rd PLMN:	244 082
	3rd ACT	GSM
	.....	
	.....	
	10th PLMN:	244 008
	10th ACT	UTRAN
	11th PLMN:	244 034
	11th ACT	UTRAN
	12th PLMN:	244 033

	12th ACT	UTRAN													
Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15
Hex	42	14	80	80	00	42	14	80	00	80	42	24	80	80	00
	B16	B17	B18	B19	B20	.....	.....	.....	.....						
	42	24	80	00	80	.....	.....	.....	.....						
	B46	B47	B48	B49	B50	B51	B52	B53	B54	B55	B56	B57	B58	B59	B60
	42	84	00	80	00	42	44	30	80	00	42	34	30	80	00

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.2.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/034

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.2.2.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 234/034 to the USS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 034
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	44	30	xx	xx	xx	00

7.2.3 UE recognising the priority order of the User controlled PLMN selector list using a ACT preference.

7.2.3.1 Definition and applicability

The User controlled PLMN selector list gives in priority order the preferred PLMNs of the User on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is

stored on the USIM in the $EF_{PLMNwACT}$. Update and deletion of User controlled PLMNs may be performed by the subscriber by the use of the PIN.

This test applies to a GSM/UMTS dual mode UE accessing both UTRAN and GSM using either ID-1 or Plug-in UICC.

7.2.3.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of the ACT identifier in the preferred list on the USIM. After the successful registration the Registered PLMN, the last used ACcess Technology field $EF_{RPLMNACT}$ shall be updated.

- TS 22.011, subclause 3.2.2;
- TS 31.102, subclauses 4.2.5 and 5.1.2.

7.2.3.2.1 Test purpose

To verify that the ACT with the higher priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the UPLMN with the lower priority when the UE performs a network selection and that the $EF_{RPLMNACT}$ is correct updated.

7.2.3.3 Method of test

7.2.3.3.1 Initial conditions

For this test both a GSM SS and a UTRAN USS is needed.

The GSM SS transmit on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/081/0001.
- Access control: unrestricted.

The UMTS USS transmit on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/082/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT set to UTRAN

Coding:	B1	B2
Hex	80	00

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.2.3.3.2 Procedure

a) The UE is powered on.

b) After receipt of a CHANNEL REQUEST from the UE, the SS sends IMMEDIATE ASSIGNMENT to the UE.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/081

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends CHANNEL RELEASE to the UE.

e) The UE is soft powered down.

7.2.3.4 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 244/081 to the SS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 081
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	14	80	xx	xx	xx	00

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT set to GSM

Coding:	B1	B2
Hex	00	80

7.2.4 UE recognising the priority order of the User controlled PLMN selector list using a ACT preference; accessing UTRAN

7.2.4.1 Definition and applicability

The User controlled PLMN selector list gives in priority order the preferred UPLMNs on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{PLMNwACT}$. Update and deletion of UPLMNs may be performed by the subscriber by the use of the PIN.

This test applies to Terminals accessing UTRAN. This test does not apply, if the previous test is performed.

7.2.4.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of the ACT identifier in the preferred list on the USIM. After the successful registration the Registered PLMN, the last used ACcess Technology field $EF_{RPLMNACT}$ shall be updated

- TS 22.011, subclause 3.2.2;
- TS 31.102, subclauses 4.2.5 and 5.1.2.

7.2.4.2.1 Test purpose

To verify that the ACT with the higher priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the UPLMN with the lower priority when the UE performs a network selection and that the $EF_{RPLMNACT}$ is correct updated.

7.2.4.3 Method of test

7.2.4.3.1 Initial conditions

The USS transmits on two BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/082/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/003/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT shall be set to GSM

Coding:	B1	B2
Hex	00	80

The UICCC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.2.4.3.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the SS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/082

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.2.4.4 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 244/081 to the SS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 082
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	24	80	xx	xx	xx	00

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT shall be set to UTRAN

Coding:	B1	B2
Hex	80	00

7.3 Operator controlled PLMN selector handling

7.3.1 UE recognising the priority order of the Operator controlled PLMN selector list.

7.3.1.1 Definition and applicability

The Operator controlled PLMN selector list gives in priority order the preferred OPLMNs on which the UE shall register if no network of the User controlled PLMN selector list is available. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{OPLMNwACT}$. Update and deletion of OPLMNs shall not be possible by the subscriber by the use of the PIN.

This test applies to Terminals accessing UTRAN.

7.3.1.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of OPLMNs in the preferred list on the USIM.

- TS 22.011, subclause 3.2.2;
- TS 31.102, subclause 4.2.53.

7.3.1.3 Test purpose

To verify that the OPLMN with the higher priority (defined by its position in $EF_{OPLMNwACT}$) takes precedence over the OPLMN with the lower priority when the UE performs a network selection.

7.3.1.4 Method of test

7.3.1.4.1 Initial conditions

For this test a USS is needed.

The USS transmits on two BCCHs, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 254/011/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/012/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{OPLMNwACT}$ (OPLMN Selector)

Logically:	1st PLMN:	254 012 (MCC MNC)
	1st ACT	UTRAN
	2nd PLMN:	254 011
	2nd ACT	UTRAN
	3rd PLMN:	254 002
	3rd ACT:	UTRAN
	4th PLMN:	254 003
	4th ACT:	UTRAN
	5th PLMN:	254 004
	5th ACT:	UTRAN
	6th PLMN:	254 005
	6th ACT:	UTRAN
	7th PLMN:	254 006
	7th ACT:	UTRAN
	8th PLMN:	254 007
	8th ACT:	UTRAN

Coding:	B01	B02	B03	B04	B05	B06	B07	B08	B09	B10
Hex	52	24	10	80	00	52	14	10	80	00
	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20
	52	24	00	80	00	52	34	00	80	00
	B21	B22	B23	B24	B25	B26	B27	B28	B29	B30
	52	44	00	80	00	52	54	00	80	00
	B31	B32	B33	B34	B35	B36	B37	B38	B39	B40
	52	64	00	80	00	52	74	00	80	00

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.3.1.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 254/012

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.3.1.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 254/012 to the USS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 254
LAI-MNC: 012
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	52	24	10	xx	xx	xx	00

7.3.2 UE recognising the priority order of the User controlled PLMN selector over the Operator controlled PLMN selector list.

7.3.2.1 Definition and applicability

The User controlled PLMN selector list has a higher priority as the OPLMN selector list on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{PLMNwACT}$.

This test applies to Terminals accessing UTRAN.

7.3.2.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of UPLMNs first before the OPLMNs in the preferred list on the USIM.

- TS 22.011, subclause 3.2.2.2;
- TS 31.102, subclauses 4.2.5 and 4.2.53.

7.3.2.3 Test purpose

To verify that the User controlled PLMN with a lower priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the OPLMN with a higher priority when the UE performs a network selection.

7.3.2.4 Method of test

7.3.2.4.1 Initial conditions

For this test a USS is needed.

The USS transmits on two BCCHs, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 254/001/0001.

- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/010/0001.
- Access control: unrestricted.

The default UICC is used.

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.3.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/010

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.3.2.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 244/010 to the USS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 010
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
	34	56	78	90	42	04	10	xx	xx	xx	00

7.4 HPLMN search handling

7.4.1 UE recognising the search period of the HPLMN

7.4.1.1 Definition and applicability

The HPLMN list gives in priority order the Home PLMN on which the UE shall register first. The HPLMN search period gives the time interval in which the UE shall search for a possible HPLMN registration.

This test applies to Terminals accessing UTRAN.

7.4.1.2 Conformance requirement

After registered onto a VPLMN the UE shall take into account the HPLMN search period timer and the priority order of the HPLMNs in the preferred list on the USIM.

- TS 22.011, subclauses 3.2.2 and 3.2.2.5.

7.4.1.3 Test purpose

To verify that the HPLMN timer is read and the HPLMN takes precedence over the VPLMN in which the UE is currently registered in.

7.4.1.4 Method of test

7.4.1.4.1 Initial conditions

For this test a UTRAN USS is needed.

The USS transmits on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/081/0001.
- Access control: unrestricted.

After the registration of UE the USS transmits on a second BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC shall be used with the following exception:

EF_{HPLMN} (HPLMN Search period)

Logically: set to 6minutes

Coding: B1
Hex 01

The UICC shall be installed into the Terminal and the UE shall be set to automatic PLMN selection mode.

7.4.1.4.2 Procedure

a) The UE shall be powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS shall send ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/081

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The USS starts to send on the second BCCH with the MCC/MNC 246/081. An internal timer shall start to run.

f) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS. The internal timer is stopped.

g) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 246/081

TMSI: "12345678"

to the UE.

h) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends CHANNEL RELEASE to the UE.

i) The UE is soft powered down.

7.4.1.5 Acceptance criteria

1) After step e) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 246/081 to the USS.

2) After step g) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) The value of the internal timer shall not exceed 6 minutes.

NOTE: To take the systems processing time into account, the value of the internal timer may allowed to be a guard time of 1 s greater than the required 6 s.

4) After step i) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 246
LAI-MNC: 081
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	42	16	80	xx	xx	xx	00

7.4.2 GSM/UMTS dual mode UEs recognising the search period of the HPLMN

7.4.2.1 Definition and applicability

The HPLMN list gives in priority order the Home PLMN on which the UE shall register first. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{HPLMNACT}$. The HPLMN search period gives the time interval in which the UE shall search for a possible HPLMN registration. To avoid a duplication of a test.

This test applies to a GSM/UMTS dual mode UE accessing both UTRAN and GSM using either ID-1 or Plug-in UICC.

To avoid a duplication of tests, this test supersede the previous test case (7.4.1).

7.4.2.2 Conformance requirement

After registered onto a VPLMN the UE shall take into account the HPLMN search period timer and the priority order of the HPLMNs in the preferred list on the USIM including the Access Technology Identifier.

- TS 22.011, subclauses 3.2.2 and 3.2.2.5.

7.4.2.3 Test purpose

To verify that the HPLMN timer is read and the HPLMN with the higher priority (defined by its position in $EF_{HPLMNwACT}$) takes precedence over the VPLMN in which the UE is currently registered in.

7.4.2.4 Method of test

7.4.2.4.1 Initial conditions

For this test both a GSM SS and a UTRAN USS is needed.

The GSM SS transmits on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/081/0001.
- Access control: unrestricted.

After the registration of UE the GSM SS transmits on a second BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

At the same time as the SS sends on a second BCCH, the UMTS USS transmit on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{HPLMNwACT}$ (HPLMN selector with Access Technology)

Logically: Set to MCC 246 and MNC 081
Set to UTRAN

Coding:	B1	B2	B3	B4	B5
Hex	42	16	80	80	00

EF_{HPLMN} (HPLMN Search period)

Logically: set to 6minutes

Coding:	B1
Hex	01

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.4.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a CHANNEL REQUEST from the UE, the SS sends IMMEDIATE ASSIGNMENT to the UE.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/081

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends CHANNEL RELEASE to the UE.

e) The SS starts to send on the second BCCH with the MCC/MNC 246/081 and the USS starts to send with the Same MCC/MNC. An internal timer shall start to run.

f) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS. The internal timer is stopped.

g) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 246/081

TMSI: "12345678"

to the UE.

h) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

i) The UE is soft powered down.

7.4.2.5 Acceptance criteria

1) After step e) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 246/081 to the USS.

2) After step g) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) The value of the internal timer shall not exceed 6 minutes.

NOTE: To take the systems processing time into account, the value of the internal timer may allowed to be a guard time of 1 s greater than the required 6 s.

4) After step i) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 246
LAI-MNC: 081
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	42	16	80	xx	xx	xx	00

7.5 RPLMNACT handling

7.5.1 UE recognising the last registered ACT

7.5.1.1 Definition and applicability

The RPLMNACT identifies the last Access Technology in which the UE was registered. Together with the identification of the last registered PLMN. This two lists shall be used for the network selection in the case the UE is within coverage (at switch-on) or returns to coverage of the PLMN on which it is already registered (as indicated by the registered PLMN stored in the USIM), the UE shall perform a location update to a new location area if necessary.

NOTE: According toTS 22.011 subclause 3.2.2.2, the last registered network take precedence even over the HPLMN.

This test applies to a GSM/UMTS dual mode UE accessing both UTRAN and GSM using either ID-1 or Plug-in UICC.

7.5.1.2 Conformance requirement

1) Recognising the network, in which the UE was last registered.

2) Recognising the Access Technology, in which the UE has last used.

3) AT the time of power on, from all available network the above network and Access Technology shall be first selected.

- TS 22.011, subclauses 3.2.2 and 3.2.2.2;
- TS 31.102, subclause 5.1.1.

7.5.1.3 Test purpose

To verify that the last registered network together with the last used Access technology takes precedence over all other available network.

7.5.1.4 Method of test

7.5.1.4.1 Initial conditions

For this test both a GSM SS and an UTRAN USS is needed.

The USS transmits on two BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 242/001/0001.
- Access control: unrestricted.

The GSM SS transmits on the BCCH with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 242/001/0001.
- Access control: unrestricted.

The default UICC shall be used with the following exception:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 242
LAI-MNC: 001
LAI-LAC: 9999
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	42	12	00	99	99	FF	00

$EF_{RPLMNACT}$ (Registered PLMN Access Technology)

Logically: set to GSM

Coding:	B1	B2
Hex	00	80

The UICC shall be installed into the Terminal and the UE shall be set to automatic PLMN selection mode.

7.5.1.4.2 Procedure

a) The UE shall be powered on.

b) After receipt of a CHANNEL REQUEST from the UE, the SS shall send IMMEDIATE ASSIGNMENT to the UE.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 242/001

LAC: 0001

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends CHANNEL RELEASE to the UE.

e) The UE is soft powered down.

7.5.1.5 Acceptance criteria

After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 242
LAI-MNC: 001
LAI-LAC: 0001
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	12	00	00	01	FF	00

3GPP TSG-T3 Meeting #28
Marseille, France, 19.08.-22.08.2003

Tdoc ⌘T3-030679

CR-Form-v7

CHANGE REQUEST

⌘ **TS 31.121 CR 027** ⌘**rev** **-** ⌘ Current version: **V4.5.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	CR 31.121 Rel-4: Usage of 3G PDU definition for UEs accessing UTRAN
Source:	⌘	T3
Work item code:	⌘	TEI
Date:	⌘	21/08/2003
Category:	⌘	**A**
Release:	⌘	Rel-4

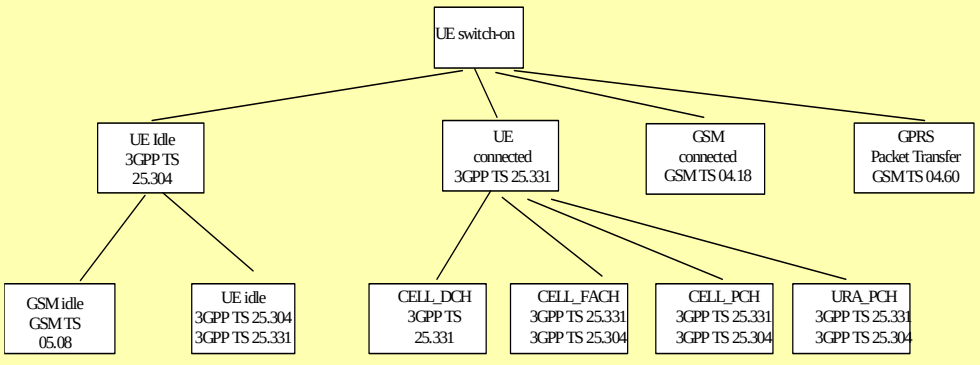
Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘

Several test cases do not cover 3G PDU definition. For a correct set up of the test cases on the Universal System Simulator and conformance with according core specifications like 25.331, it is essential to use the required 3G terminology.

The following figure in 3GPP TS 25.331, ch. 4.1 summarises the mapping of UE states, including states in GSM, to the appropriate UTRA and GSM specifications that specify the UE behaviour.



Summary of change: ⌘ Affected conformance requirements and test procedure have been changed so that 3G funktionality is covered. Reference and abbreviations chapters enhanced accordingly.

Consequences if not approved: ⌘ The affected tests can not be implemented on any test system in an accurate way, because IMMEDIATE ASSIGNMENT does not exist in 3G.

Clauses affected:	⌘	2, 3.3, 5.1.1.2, 5.1.1.4.2, 5.1.1.5, 5.1.2.2, 5.1.2.4.2, 5.1.3.2, 5.1.3.4.2, 5.1.3.5, 5.1.4.2, 5.1.4.4.2, 5.1.5.2, 5.1.5.4.2, 6.4.2.4.2, 6.4.3.4.2, 6.4.4.4.2, 7.1.1.4.2, 7.1.2.4.2, 7.1.3.4.2, 7.2.2.4.2, 7.2.4.3.2, 7.3.1.4.2, 7.3.2.4.2, 7.4.1.4.2, 7.4.2.4.2			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] ISO/IEC 7816-1 (1998): "Identification cards - Integrated circuit(s) cards with contacts - Part 1: Physical characteristics".

[2] ISO/IEC 7816-6 (1996): "Identification cards - Integrated circuit(s) cards with contacts - Part 6: Interindustry data elements".

[3] 3GPP TS 23.038: "Alphabets and language-specific information".

[4] 3GPP TS 31.102: "Characteristics of the USIM application".

[5] ETSI TS 102 221: "UICC-Terminal interface; Physical and logical characteristics".

[6] 3GPP TS 22.011: "Service accessibility".

[7] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[8] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[9] 3GPP TS 23.086: "Advice of Charge (AoC) Supplementary Service - Stage 2".

[10] 3GPP TS 24.086: "Advice of Charge (AoC) Supplementary Service - Stage 3".

[11] 3GPP TS 22.101: "Service aspects; Service principles".

[12] 3GPP TS 22.030: "Man-Machine Interface (MMI) of the User Equipment (UE)".

[13] 3GPP TS 23.040: " Technical realization of the Short Message Service (SMS)".

[14] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[15] GSM 04.18: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

[16] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core Network protocols; Stage 3".

[17] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary service specification; Formats and coding".

[18] 3GPP TS 22.086: "Advice of Charge (AoC) supplementary services; Stage 1".

[19] 3GPP TS 21.111: "USIM and IC card requirements".

[20] 3GPP TS 25.331 "Radio Resource Control (RRC); Protocol Specification "

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	3rd Generation
3GPP	3rd Generation Partnership Project
ACC	ACcess Class

ACL	APN Control List
ACM	Accumulated Call Meter
ACMmax	ACM maximal value
ACT	ACcess Technology
ADF	Application Dedicated File
AoC	Advice of Charge
AoCC	Advice of Charge Charging
APN	Access Point Name
ATR	Answer To Reset
BCCH	Broadcast Control Channel
BCD	Binary Coded Decimal
BDN	Barred Dialling Number
CCI	Capability / Configuration Identifier
CCM	Current Call Meter
CK	Cipher key
DF	Dedicated File
EF	Elementary File
EMMI	Electrical Man Machine Interface
Ext n	Extension n
FDN	Fixed Dialling Number
FPLMN	Forbidden PLMN
GSM	Global System for Mobile communications
HPLMN	Home PLMN
ICC	Integrated Circuit Card
ID	IDentifier
IEC	International Electrotechnical Commission
IK	Integrity key
IMSI	International Mobile Subscriber Identity
ISO	International Organization for Standardization
KSI	Key Set Identifier
LAC	Location Area Code
LAI	Location Area Information
LSB	Least Significant Bit
MCC	Mobile Country Code
MF	Master File
MMI	Man Machine Interface
MNC	Mobile Network Code
MSB	Most Significant Bit
NAS	Non Acess Stratum
NPI	Numbering Plan Identifier
OFM	Operational Feature Monitor
OSI	Open System Interconnection
P1	Parameter 1
P2	Parameter 2
P3	Parameter 3
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PS	Packet switched
RACH	Random Access Channel
RRC	Radio Resource Control
RFU	Reserved for Future Use
RPLMN	last Registered PLMN
SS	System Simulator (GSM)
TE	Terminal Equipment
TLV	Tag Length Value
TMSI	Temporary Mobile Subscriber Identity
TON	Type Of Number
UE	User Equipment
UICC	Universal ICC
USIM	Universal Subscriber Identity Module
USS	UMTS System Simulator
UTRAN	UMTS Terrestrial Radio Access Network

VPLMN Visitor PLMN

3.5 Generic procedures for UTRAN

If a test case contains the statement "This test applies to Terminals accessing UTRAN", the procedures defined inside TS 24.008 [16], subclause 7.2 shall be the basis for all performed procedures during the test. The procedures in subclause 7.2 describe the default behaviour of a conformant UE regarding the specified protocols to be used for UTRAN and the required procedures from the NAS.

5 Subscription related tests

5.1 IMSI / TMSI handling

5.1.1 UE identification by short IMSI

5.1.1.1 Definition and applicability

The IMSI is used for unique identification of the UE by UTRAN. The IMSI is stored in the USIM and read during the UICC-Terminal initialisation procedure.

This test applies to Terminals accessing UTRAN.

5.1.1.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNTMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the IMSI of the USIM, which is less than the maximum length.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4;
- TS 102 221, subclause 14.1.1.

5.1.1.3 Test purpose

1) To verify that the Terminal uses the IMSI of the USIM.
2) To verify that the Terminal can handle an IMSI of less than the maximum length.
3) To verify that the READ EF_{IMSI} command is performed correctly by the terminal

5.1.1.4 Method of test

5.1.1.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.

- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is installed into the Terminal and the UE is powered on.

5.1.1.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI stored in the USIM.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.1.5 Acceptance criteria

After step b) the UE shall send PAGING RESPONSE to the USS containing the IMSI stored in the USIM.

5.1.2 UE identification by short IMSI using a 2 digit MNC

5.1.2.1 Definition and applicability

In some networks the IMSI identifying the UTRAN can be consistence of a 2 digit MNC. The IMSI is stored in the USIM and read during the UICC-Terminal initialisation procedure.

This test applies to Terminals accessing UTRAN.

5.1.2.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNTMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the IMSI of the USIM.

Reference:

- TS 31.102, subclause 4.2.18;
- TS 24.008, subclause 10.5.1.4.

5.1.2.3 Test purpose

1) To verify that the Terminal can handle an IMSI consistence of a 2 digit MNC.

5.1.2.4 Method of test

5.1.2.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/81/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{IMSI} (IMSI)

Logically: 246813579

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9
Hex	05	29	64	18	53	97	FF	FF	FF

EF_{AD} (Administrative Data)

Logically: Normal operation
OFM to be deactivated by the Terminal
MNC: 2 digit

Coding:	B1	B2	B3	B4
Hex	00	00	00	02

The UICC is installed into the Terminal and the UE is powered on.

5.1.2.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI stored in the USIM.

b) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.2.5 Acceptance criteria

After step b) the UE shall send PAGING RESPONSE to the USS containing the IMSI stored in the USIM.

5.1.3 UE identification by "short" TMSI

5.1.3.1 Definition and applicability

The TMSI is temporarily used for identification of the UE by UTRAN. It will have been previously assigned by the network. The TMSI is stored in the USIM by the Terminal and read during the USIM-Terminal initialisation procedure.

NOTE: According to TS 23.003, subclause 2.4, a TMSI always consists of 8 digits (4 bytes). With this tests the handling of a TMSI with leading zeros will be tested. The term "short" TMSI is used in order to distinguish between the tests as defined in subclauses 5.1.3 and 5.1.4.

This test applies to Terminals accessing UTRAN.

5.1.3.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the TMSI stored in the USIM. According to subclause 10.3.1.17 in TS 25.331 [20] the TMSI has a fixed length of 32 bit (8 digits) when used inside the PAGING TYPE 1 message.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4.
- TS 25.331, subclause 10.3.1.17

5.1.3.3 Test purpose

1) To verify that the Terminal uses the TMSI stored in the USIM.

2) To verify that the Terminal can handle a TMSI of less than maximum length.

5.1.3.4 Method of test

5.1.3.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{LOCI} (Location Information)

Logically:
LAI-MCC: 246
LAI-MNC: 081
LAI-LAC: 0001
TMSI: "2143"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	00	00	21	43	42	16	80	00	01	FF	00

The UICC is installed into the Terminal and the UE is powered on.

5.1.3.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the TMSI stored in the USIM matching the required length of 8 digits.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.3.5 Acceptance criteria

After step b) the UE shall send PAGING RESPONSE to the USS containing the TMSI stored in the USIM.

5.1.4 UE identification by "long" TMSI

5.1.4.1 Definition and applicability

The TMSI is temporarily used for identification of the UE by UTRAN. It will have been previously assigned by the network. The TMSI is stored in the USIM by the Terminal and read during the USIM-Terminal initialisation procedure.

NOTE: According to TS 23.003, subclause 2.4, a TMSI always consists of 8 digits (4 bytes). With this tests the handling of a new assigned TMSI will be tested. The term "long" TMSI is used in order to distinguish between the tests as defined in subclauses 5.1.3 and 5.1.4.This test applies to Terminals accessing UTRAN.

5.1.4.2 Conformance requirement

~~On the receipt of an IMMEDIATE ASSIGNMENT message~~ After successful completion of the RRC Connection Establishment procedure the UE shall send PAGING RESPONSE containing the correct TMSI stored in the USIM.

According to subclause 10.3.1.17 in TS 25.331 [20] the TMSI has a fixed length of 32 bit (8 digits) when used inside the PAGING TYPE 1 message.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4.
- TS 25.331, subclause 10.3.1.17

5.1.4.3 Test purpose

1) To verify that the Terminal uses the TMSI stored in the USIM.
2) To verify that the Terminal can handle a TMSI of maximum length.
3) To verify that the Terminal does not respond to page requests containing a previous TMSI.

5.1.4.4 Method of test

5.1.4.4.1 Initial conditions

Prior to this test, the Terminal shall have been operated with a USIM containing TMSI "2143". This may be achieved by executing the previous test (5.1.3) prior to this test. Only under this condition will test purpose 3) be verified.

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{LOCI} (Location Information)

Logically:
LAI-MCC: 246
LAI-MNC: 081
LAI-LAC: 0001
TMSI: "21430000"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	21	43	00	00	42	16	80	00	01	FF	00

The UICC is installed into the Terminal and the UE is powered on.

5.1.4.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the TMSI "0000~~2~~143".

b) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the TMSI stored in the USIM.

c) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

d) After receipt of a PAGING RESPONSE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

5.1.4.5 Acceptance criteria

1) After step a) the UE shall not respond to the PAGING REQUEST.

2) After step c) the UE shall send PAGING RESPONSE to the USS containing the TMSI stored in the USIM.

5.1.5 UE identification by long IMSI, TMSI updating and key set identifier assignment

5.1.5.1 Definition and applicability

The IMSI and TMSI are used for identification of the UE by UTRAN. They are read from the USIM during the USIM-Terminal initialisation procedure. Within the authentication procedure the network sends a key set identifier to the UE. In addition the network may allocate a new TMSI to the UE. Key set identifier and TMSI are stored in the USIM after call termination and/or at a 3G session termination.

This test applies to Terminals accessing UTRAN.

NOTE: According to TS 24.008 [16] the term KSI may be used instead of the term ciphering key sequence number which is used inside the MM message AUTHENTICATION REQUEST.

5.1.5.2 Conformance requirement

1) After successful completion of the RRC Connection Establishment procedure~~On the receipt of an IMMEDIATE ASSIGNMENT message,~~ the UE shall send PAGING RESPONSE containing the correct IMSI stored in the USIM.

Reference:

- TS 31.102, subclauses 5.1.1 and 5.2.2;
- TS 24.008, subclause 10.5.1.4.

2) After call termination the USIM shall contain the key set identifier (ciphering key sequence number) and TMSI received by the UE during the authentication and TMSI reallocation procedures.

Reference:

- TS 31.102, subclauses 5.1.2, 5.2.5 and 5.2.6;
- TS 21.111 subclause 10.1.
- TS 24.008 subclause 4.3.2.4.

3) After call termination the Terminal shall have updated EFLOCI.

Reference:

- TS 102 221, subclause 14.1.2.

5.1.5.3 Test purpose

1) To verify that the Terminal uses the IMSI stored in the USIM.

2) To verify that the Terminal does not respond to page requests containing a previous IMSI.

3) To verify that the Terminal can handle an IMSI of maximum length.

4) To verify that the Terminal correctly updates the key set identifier at call termination.

5) To verify that the Terminal correctly updates the TMSI at call termination.

6) To verify that the UPDATE EF_{LOCI} command is performed correctly by the terminal.

5.1.5.4 Method of test

5.1.5.4.1 Initial conditions

Prior to this test, the Terminal shall have been operated with a USIM containing IMSI "2460813579". This may be achieved by executing the previous test (5.1.4) prior to this test. Only under this condition will test purpose 2) be verified.

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{IMSI} (IMSI)

Logically: 246081111111111

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9
Hex	08	29	64	80	11	11	11	11	11

The UICC is installed into the Terminal and the UE is powered on.

5.1.5.4.2 Procedure

a) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI "2460813579".

b) The USS sends PAGING ~~REQUEST~~ TYPE 1 to the UE using the IMSI stored in the USIM.

c) After receipt of a RRC CONNECTION~~CHANNEL~~ REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

d) After receipt of a PAGING RESPONSE from the UE, the USS sends AUTHENTICATION REQUEST to the UE containing Key Set Identifier KSI (ciphering key sequence number) set to binary 010.

e) After receipt of AUTHENTICATION RESPONSE from the UE, the USS sends TMSI REALLOCATION COMMAND to the UE containing TMSI "32547698".

f) Within 5 s after receipt of TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE.

g) To allow examination of the values in the USIM after call termination the UE shall not be soft powered down. If the test is performed with a USIM simulator, the simulation is stopped. If the test is performed with a USIM, the UICC is removed without soft powering down the UE. If this is not possible, the power supply of the Terminal is removed and then the UICC removed.

5.1.5.5 Acceptance criteria

1) After step a) the UE shall not respond to the PAGING TYPE 1.~~REQUEST~~.

2) After step c) the UE shall send PAGING RESPONSE to the USS containing the IMSI stored in the USIM.

3) After step e) the UE shall send TMSI REALLOCATION COMPLETE to the USS.

4) After step g) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 246
LAI-MNC: 081
TMSI: "32547698"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	32	54	76	98	42	16	80	xx	xx	xx	00

EF_{Keys} (Ciphering and Integrity Keys)

Logically: Key Set Identifier KSI: 02
Ciphering Keys CK: xx (result of the authentication algorithm)
Integrity Keys IK: xx (result of the authentication algorithm)

Coding:	B1	B2	B3	...	B16	B17	B18	...	B31	B32	B33
Hex	02	xx	xx	...	Xx	xx	xx	...	xx	xx	xx

6.4 Advice of charge (AoC) handling

[..]

6.4.2 Maximum frequency of ACM updating

6.4.2.1 Definition and applicability

The ACM shall be updated at the end of every interval, where the interval length is given by parameter e2. The Terminal shall update the ACM not more frequently than once every 5 s, even if the interval is less than 5 s. More frequent updating may affect the USIMs read/write cycles.

This test applies to Terminals accessing UTRAN. Besides of that, this test is applicable only to those Terminals supporting AoCC.

6.4.2.2 Conformance requirement

The ACM shall be incremented when the CCM is incremented or once every 5 s, whichever is the longer period.

Reference:

- TS 22.024, subclause 4.3, part h.

6.4.2.3 Test purpose

To verify that the interval between increments is 5 s.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

The Terminal shall be connected to the USIM simulator, with all elementary files coded as default with the exception of:

EF_{UST} (USIM Service Table)

Logically: Local Phone Book available.
User controlled PLMN selector available.

Fixed dialling numbers available.
The GSM Access available.
The Group Identifier level 1 and level 2 not available.
AoC available.
Service n 33 (Packed Switched Domain) shall be set to '1'.

Coding:	B1	B2	B3	B4	B5
binary	xxxx xx11	xxx1 xxxx	xxxx 1x00	xxxx x1xx	xxxx xxx1

The coding of EF_{UST} shall conform with the capabilities of the USIM used.

EF_{ACM} (Accumulated call meter)

Logically: 50 units

EF_{ACMmax} (Accumulated call meter maximum)

Logically: 150 units

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

User Equipment:

- The UE is in MM-state "idle, updated".

6.4.2.4.2 Procedure

a) The UE is made to initiate a call. The call establishment shall be performed according to the procedures defined in TS 24.008 [16], subclause 7.2.3.2.3 extended by the messages of the AoCC. The call is established with AoCC e-parameters sent in a Facility IE in the CONNECT message, as given below. The UE returns the AoCC acknowledgement within 1 s of the CONNECT message. It is an implementation option whether the AoCC acknowledge is sent by the UE before or after the CONNECT ACKNOWLEDGE.

b) The call is maintained for 90 s, then terminated by the USS. During the call, the USIM-simulator monitors the time intervals between successive INCREMENT commands.

Maximum Duration of Test:

2 minutes.

Expected Sequence:

Step	Direction	Message	Comments
1	UE		The UE is made to initiate a call
2	UE -> USS	~~CHANNEL~~ RRC CONNECTION REQUEST	
3	USS -> UE	~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP	
4	UE -> USS	RRC CONNECTION SETUP COMPLETE	
5~~4~~	UE -> USS	CM SERVICE REQUEST	
6	USS -> UE	AUTHENTICATION REQUEST	MM procedure, to ensure the successful start of integrity in step 8
7	UE -> USS	AUTHENTICATION RESPONSE	
8	USS -> UE	SECURITY MODE COMMAND	RRC procedure, start of integrity is mandatory during call setup
9	UE -> USS	SECURITY MODE COMPLETE	
~~5~~	~~USS -> UE~~	~~CM SERVICE ACCEPT~~	
10~~6~~	UE -> USS	SETUP	
11~~7~~	USS -> UE	CALL PROCEEDING	
12~~8~~	USS -> UE	~~ASSIGNMENT COMMAND~~RADIO BEARER SETUP	To a supported channel type
13~~9~~	UE -> USS	~~ASSIGNMENT~~ RADIO BEARER SETUP COMPLETE	
~~10~~14	USS -> UE	ALERTING	
~~11~~15	USS -> UE	CONNECT	As default message except contains Facility IE with contents as indicated in i) below
			Either A or B branch is taken
A16~~2~~	UE -> USS	CONNECT ACKNOWLEDGE	
A17~~3~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B16~~2~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B17~~3~~	UE -> USS	CONNECT ACKNOWLEDGE	
18~~4~~			call duration 90 s after CAI information sent by USS,
19~~5~~	USS -> UE	DISCONNECT	
20~~16~~	UE -> USS	RELEASE	
21~~7~~	USS -> UE	RELEASE COMPLETE	
22~~18~~	USS -> UE	~~CHANNEL~~ RRC CONNECTION RELEASE	~~The main signalling link is~~All connections of RRC are released.
23	UE -> USS	RRC CONNECTION RELEASE COMPLETE	

Specific Message Contents:

i) **FACILITY Information Element** with **Invoke = ForwardChargeInformation** component type as defined in TS 24.080 subclauses 3.6.1 table 3.3.

For ASN.1 description see default message contents in subclause 31.6.1.3.

The values of the e-parameters within the parameter part of the Facility Information Element shall be set as below:

e-parameters:

parameter:	e1	e2	e3	e4	e5	e6	e7
value	1	1	1	0	0	0	0

Values shown in table are in the format and have units as in TS 22.024 clause 3.

ii) **FACILITY Information Element** with **Return Result** component type as defined in TS 24.080 subclause 3.6.1 table 3.4.

For ASN.1 description see default message contents in subclause 31.6.1.3.

6.4.2.5 Acceptance criteria

The UE shall send INCREMENT commands to the USIM every 5 s.

6.4.3 Call terminated when ACM greater than ACMmax

6.4.3.1 Definition and applicability

ACMmax gives the maximum value of ACM, at which the current chargeable calls shall be terminated and no further calls may be made (except emergency calls).

This test applies to Terminals accessing UTRAN. Besides of that, this test is applicable only to those Terminals supporting AoCC.

6.4.3.2 Conformance requirement

ACM shall be incremented by the value of CCM.

If the ACMmax is valid, and the ACM becomes equal to or exceeds the value of the ACMmax, then all calls in progress, chargeable to the user, shall be terminated by the UE, once the chargeable interval determined by the CAI has elapsed, (except emergency calls).

Reference:

- TS 22.024, subclauses 4.2.2 and 4.3 (part h);
- TS 102 221, subclause 14.1.3.

6.4.3.3 Test purpose

1) To verify that the Terminal increments the ACM by the correct number of units, even though this may take ACM above ACMmax.
2) To verify that the Terminal terminates the call.
3) To verify that the INCREMENT EF_{ACM} command is performed correctly by the terminal.

6.4.3.4 Method of test

6.4.3.4.1 Initial conditions

The Terminal shall be connected to a UICC or the USIM simulator, with all elementary files coded as default with the exception of:

EF_{UST} (USIM Service Table)

Logically: Local Phone Book available;
User controlled PLMN selector available;
Fixed dialling numbers available;
The GSM Access available;
The Group Identifier level 1 and level 2 not available;
AoC available;
Service n 33 (Packed Switched Domain) shall be set to '1'.

Coding:	B1	B2	B3	B4	B5
binary	xxxx xx11	xxx1 xxxx	xxxx 1x00	xxxx x1xx	xxxx xxx1

The coding of EF_{UST} shall conform with the capabilities of the USIM used.

EF_{ACM} (Accumulated call meter)

Logically: 80 units

Coding:	B1	B2	B3
binary	0000 0000	0000 0000	0101 0000

EF_{ACMmax} (Accumulated call meter maximum)

Logically: 94 units

Coding:	B1	B2	B3
binary	0000 0000	0000 0000	0101 1110

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

User Equipment:

The UE is in MM-state "idle, updated".

6.4.3.4.2 Procedure

a) The UE is made to initiate a call. The call establishment shall be performed according to the procedures defined in TS 24.008 [16], subclause 7.2.3.2.3 extended by the messages of the AoCC. The call is established with AoCC e-parameters sent in a Facility IE in the CONNECT message, as given below. The UE returns the AoCC acknowledgement within 1 s of the CONNECT message. It is an implementation option whether the AoCC acknowledge is sent by the UE before or after the CONNECT ACKNOWLEDGE.

b) The call is maintained until cleared by the UE (after 30 s).

c) The contents of ACM are checked.

Maximum Duration of Test:

2 minutes.

Expected Sequence:

Step	Direction	Message	Comments
1	UE		The UE is made to initiate a call
2	UE -> USS	~~CHANNEL~~ RRC CONNECTION REQUEST	
3	USS -> UE	~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP	
4	UE -> USS	RRC CONNECTION SETUP COMPLETE	
~~4~~	~~UE -> USS~~	~~CM SERVICE REQUEST~~	
5	USS -> UE	AUTHENTICATION REQUEST	MM procedure, to ensure the successful start of integrity in step 8
6	UE -> USS	AUTHENTICATION RESPONSE	
7	USS -> UE	SECURITY MODE COMMAND	RRC procedure, start of integrity is mandatory during call setup
8	UE -> USS	SECURITY MODE COMPLETE	
~~6~~5	~~USS -> UE~~	~~CM SERVICE ACCEPT~~	
~~6~~9	UE -> USS	SETUP	
10~~7~~	USS -> UE	CALL PROCEEDING	
11~~8~~	USS -> UE	RADIO BEARER SETUP~~ASSIGNMENT COMMAND~~	To a supported channel type
12~~9~~	UE -> USS	RADIO BEARER SETUP COMPLETE~~ASSIGNMENT COMPLETE~~	
10~~3~~	USS -> UE	ALERTING	
14~~1~~	USS -> UE	CONNECT	As default message except contains Facility IE with contents as indicated in i) below
			Either A or B branch is taken
A15~~2~~	UE -> USS	CONNECT ACKNOWLEDGE	
A16~~3~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B12~~5~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B13~~6~~	UE -> USS	CONNECT ACKNOWLEDGE	
17~~4~~			call duration 30 s after CAI information sent by USS
15~~8~~	UE -> USS	DISCONNECT	
16~~9~~	USS -> UE	RELEASE	
201~~7~~	UE -> USS	RELEASE COMPLETE	
211~~8~~	UE -> USS	~~CHANNEL~~ RRC CONNECTION RELEASE	All connections of RRC are released.~~The main signalling link is released.~~
22	UE -> USS	RRC CONNECTION RELEASE COMPLETE	

Specific Message Contents:

i) **FACILITY Information Element** with **Invoke = ForwardChargeInformation** component type as defined in TS 24.080 subclause 3.6.1 table 3.3.

For ASN.1 description see default message contents in subclause 31.6.1.3.

The values of the e-parameters within the parameter part of the Facility Information Element shall be set as below:

e-parameters:

parameter:	e1	e2	e3	e4	e5	e6	e7
value	10	10	1	0	0	0	0

Values shown in table are in the format and have units as in TS 22.024 clause 3.

ii) FACILITY Information Element with **Return Result** component type as defined in TS 24.080 subclause 3.6.1 table 3.4.

For ASN.1 description see default message contents in subclause 31.6.1.3.

6.4.3.5 Acceptance criteria

1) The UE shall terminate the call correctly 30 s after CAI was sent.

2) The value of ACM shall be 100 units.

6.4.4 Response codes of increase command of ACM

6.4.4.1 Definition and applicability

ACM has a maximum value in terms of coding, and an attempt by the Terminal to exceed that value by sending an INCREASE command shall result in an error message from the USIM. As the maximum of the ACM is equal to the maximum value of ACMmax, all current chargeable calls shall be terminated and no further calls may be made (except emergency calls).

This test applies to Terminals accessing UTRAN. Besides of that, this test is applicable only to those Terminals supporting AoCC.

6.4.4.2 Conformance requirement

The Terminal shall perform the increasing procedure, sending the amount to be increased.

The running accumulated charge shall be stored in the ACM of the USIM.

Where this charge cannot be stored in the UE, use of the telecommunications service shall be prevented.

At the time ACM exceeds it's maximum value, then all calls in progress, chargeable to the user, shall be terminated by the UE, once the chargeable interval determined by the CAI has elapsed, (except emergency calls).

References:

- TS 31.102, subclause 5.3.4;
- TS 22.086, subclauses 2.1 and 2.2.1.

6.4.4.3 Test purpose

To verify that the Terminal clears a charged call if the USIM indicates that the ACM cannot be increased.

6.4.4.4 Method of test

6.4.4.4.1 Initial conditions

The Terminal shall be connected to the USIM simulator, with all elementary files coded as default with the exception of:

EF_{UST} (USIM Service Table)

Logically: Local Phone Book available;
User controlled PLMN selector available;
Fixed dialling numbers available;
The GSM Access available;
The Group Identifier level 1 and level 2 not available;
AoC available;
Service n 33 (Packed Switched Domain) shall be set to '1'.

Coding:	B1	B2	B3	B4	B5
binary	xxxx xx11	xxx1 xxxx	xxxx 1x00	xxxx x1xx	xxxx xxx1

The coding of EF_{UST} shall conform with the capabilities of the USIM used.

EF_{ACM} (Accumulated call meter)

Logically: (Maximum value - 10) units

Coding:	B1	B2	B3
binary	1111 1111	1111 1111	1111 0101

EF_{ACMmax} (Accumulated call meter maximum)

Logically: (Maximum value - 2) units

Coding:	B1	B2	B3
binary	1111 1111	1111 1111	1111 1101

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

User Equipment:

The UE is in MM-state "idle, updated".

6.4.4.4.2 Procedure

a) The UE is made to initiate a call. The call establishment shall be performed according to the procedures defined in TS 24.008 [16], subclause 7.2.3.2.3 extended by the messages of the AoCC. The call is established with AoCC e-parameters sent in a Facility IE in the CONNECT message, as given below. The UE returns the AoCC acknowledgement within 1 s of the CONNECT message. It is an implementation option whether the AoCC acknowledge is sent by the UE before or after the CONNECT ACKNOWLEDGE.

b) After an interval has elapsed, the Terminal increments the ACM. When an INCREASE command is received, the USIM-simulator sends back the error "98 50".

c) Conditions are reset to those described in the initial conditions. Steps a) and b) of the test are repeated, except that the error code sent by the USIM simulator at step b) is now "6F xx".

d) Conditions are reset to those described in the initial conditions. Steps a) and b) of the test are repeated, except that the error code sent by the USIM simulator at step b) is now "65 81".

References:

- TS 102 221, subclause 10.2.1.

Maximum Duration of Test:

3 minutes.

Expected Sequence:

Step	Direction	Message	Comments
1	UE		The UE is made to initiate a call
2	UE -> USS	~~CHANNEL~~ RRC CONNECTION REQUEST	
3	USS -> UE	~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP	
4	UE -> USS	RRC CONNECTION SETUP COMPLETE	
~~4~~	~~UE -> USS~~	~~CM SERVICE REQUEST~~	
5	USS -> UE	AUTHENTICATION REQUEST	MM procedure, to ensure the successful start of integrity in step 8
6	UE -> USS	AUTHENTICATION RESPONSE	
7	USS -> UE	SECURITY MODE COMMAND	RRC procedure, start of integrity is mandatory during call setup
8	UE -> USS	SECURITY MODE COMPLETE	
9~~5~~	~~USS -> UE~~	~~CM SERVICE ACCEPT~~	
10~~6~~	UE -> USS	SETUP	
11~~7~~	USS -> UE	CALL PROCEEDING	
12~~8~~	USS -> UE	RADIO BEARER SETUP~~ASSIGNMENT COMMAND~~	to a supported channel type
13~~9~~	UE -> USS	RADIO BEARER SETUP COMPLETE~~ASSIGNMENT COMPLETE~~	
1~~0~~4	USS -> UE	ALERTING	
15~~1~~	USS -> UE	CONNECT	As default message except contains Facility IE with contents as indicated in i) below
			Either A or B branch is taken
A1~~2~~6	UE -> USS	CONNECT ACKNOWLEDGE	
A17~~3~~	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B1~~2~~6	UE -> USS	FACILITY	As default message except contains Facility IE with contents as indicated in ii) below
B17~~3~~	UE -> USS	CONNECT ACKNOWLEDGE	
18~~4~~			call duration 10s after CAI information sent by USS
1~~5~~9	UE -> USS	DISCONNECT	
20~~16~~	USS -> UE	RELEASE	
21~~7~~	UE -> USS	RELEASE COMPLETE	
22~~18~~	UE -> USS	~~CHANNEL~~RRC CONNECTION RELEASE	All connections of RRC are released.~~The main signalling link is released.~~
23	UE -> USS	RRC CONNECTION RELEASE COMPLETE	

Specific Message Contents:

i) **FACILITY Information Element** with **Invoke = ForwardChargeInformation** component type as defined in TS 24.080 subclause 3.6.1 table 3.3.

The values of the e-parameters within the parameter part of the Facility Information Element shall be set as below:

e-parameters:

parameter:	e1	e2	e3	e4	e5	e6	e7
value	20	10	1	0	0	0	0

Values shown in table are in the format and have units as in TS 22.024 clause 3.

ii) **FACILITY Information Element** with **Return Result** component type as defined in TS 24.080 subclause 3.6.1 table 3.4.

6.4.4.5 Acceptance criteria

1) The UE shall terminate the call correctly 10 s after CAI was sent.

2) In each of the three cases, as described in steps b), c) and d) of the procedure, the UE shall terminate the call correctly when it receives an indication from the USIM that the ACM cannot be incremented.

7 PLMN related tests

7.1 FPLMN handling

7.1.1 Adding FPLMN to the Forbidden PLMN list

7.1.1.1 Definition and applicability

A list of forbidden PLMNs stored in the USIM and providing storage for at least 4 entries is managed by the UE. In automatic PLMN selection mode the UE controls location updating attempts to appropriate networks with respect to this list of forbidden PLMNs. As a result of a location update reject with the cause "PLMN not allowed" the UE stores the PLMN which rejected the update request in the USIM.

After a location update, which is not followed by an authentication procedure, the Key Set Identifier indicates that the Key Set Identifier is undefined.

NOTE: According to TS 24.008 [16] the term KSI may be used instead of the term ciphering key sequence number which is used inside the MM message AUTHENTICATION REQUEST.

This test applies to Terminals accessing UTRAN.

7.1.1.2 Conformance requirement

1) In automatic PLMN selection mode the UE shall only attempt a LOCATION UPDATE if it receives a BCCH containing a LAI that is not indicated in the EF_{FPLMN} in the USIM.

Reference:

- TS 22.011, subclause 2.3;
- TS 31.102, subclauses 5.1.1 and 5.2.7.

2) After receipt of a LOCATION UPDATE REJECT message with the cause "PLMN not allowed" the Terminal shall update the EF_{FPLMN} in the USIM.

Reference:

- TS 22.011, subclause 2.3;
- TS 31.102, subclauses 5.1.1 and 5.2.7.

3) After call termination the USIM shall contain the correct Key Set Identifier.

Reference:

- TS 31.102, subclauses 5.1.2, 5.2.5 and 5.2.6;
- TS 21.111, subclause 10.1.

4) After call termination the USIM shall contain the correct TMSI and location information received by the UE.

Reference:

- TS 31.102, subclauses 5.1.2, 5.2.5 and 5.2.6;
- TS 21.111, subclause 10.1.

7.1.1.3 Test purpose

1) To verify that in automatic PLMN selection mode the UE does not attempt to access PLMNs stored in EF_{FPLMN} on the USIM.

2) To verify that the EF_{FPLMN} is correctly updated by the Terminal after receipt of a LOCATION UPDATE REJECT message with cause "PLMN not allowed".

3) To verify that the EF_{Keys} has been correctly updated by the Terminal.

4) To verify that the EF_{LOCI} has been correctly updated by the Terminal.

7.1.1.4 Method of test

[..]

7.1.1.4.2 Procedure

a) The UE is powered on.

b) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/003

The USS then resumes RF output on the BCCH.

c) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/004

The USS then resumes RF output on the BCCH.

d) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/005

The USS then resumes RF output on the BCCH.

e) The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/007

The USS then resumes RF output on the BCCH.

f) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

g) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE REJECT to the UE with cause "PLMN Not Allowed", followed by ~~CHANNEL~~ RRC CONNECTION RELEASE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

The USS stops all RF output on the BCCH for a long enough period of time to cause a cell reselection procedure in the UE. The BCCH is changed to contain:

LAI (MCC/MNC): 234/008

The USS then resumes RF output on the BCCH.

h) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends RRC CONNECTION SETUP~~IMMEDIATE ASSIGNMENT~~ to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

i) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 234/008

TMSI: "43658709"

to the UE.

j) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS~~CHANNEL RELEASE to the UE~~.

k) The UE is soft powered down.

7.1.1.5 Acceptance criteria

1) After each of the steps a) to d) the UE shall not attempt a LOCATION UPDATE.

2) After step f) the UE shall send LOCATION UPDATE REQUEST to the USS.

3) After step h) the UE shall send LOCATION UPDATE REQUEST to the USS.

4) After step i) the UE shall respond with TMSI REALLOCATION COMPLETE.

5) After step k) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 234
LAI-MNC: 008
TMSI: "43658709"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	43	65	87	09	32	84	00	xx	xx	xx	00

EF_{Keys} (Ciphering and Integrity Keys)

Logically: Key Set Identifier KSI: 07 (not available)
Ciphering Keys CK: xx
Integrity Keys IK: xx

Coding:	B1	B2	B3	...	B16	B17	B18	...	B31	B32	B33
Hex	07	xx	xx	...	Xx	xx	xx	...	xx	xx	xx

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: 234 002 (MCC MNC)
PLMN2: 234 003
PLMN3: 234 004
PLMN4: 234 005
PLMN5: 234 006
PLMN6: 234 007

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	24	00	32	34	00	32	44	00	32	54	00
	B13	B14	B15	B16	B17	B18						
	32	64	00	32	74	00						

7.1.2 UE updating forbidden PLMNs

7.1.2.1 Definition and applicability

A list of forbidden PLMNs stored in the USIM provides storage for at least 4 entries, and is managed by the UE. In automatic PLMN selection mode the UE controls location updating attempts to appropriate networks with respect to this list of forbidden PLMNs. As a result of a location update reject with the cause "PLMN not allowed" the UE stores the PLMN which rejected the update request in the USIM.

This test applies to Terminals accessing UTRAN.

7.1.2.2 Conformance requirement

After the receipt of a LOCATION UPDATE REJECT message with the cause "PLMN not allowed" the UE shall update the EF_{FPLMN} in the USIM.

Reference:

- TS 22.011, subclause 3.2.2.4.

7.1.2.3 Test purpose

To verify that the UE correctly updates the EF_{FPLMN}, i.e. fill up existing gaps in the elementary file before overwriting any existing entries.

7.1.2.4 Method of test

7.1.2.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 234/002/0001.

-Access control: unrestricted.

The default UICC is used with the following exception:

EF_{FPLMN} (Forbidden PLMNs)

Logically:	PLMN1:	234 001 (MCC MNC)
	PLMN2:	empty
	PLMN3:	234 003
	PLMN4:	234 004
	PLMN5:	234 005
	PLMN6:	234 006

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	14	00	FF	FF	FF	32	34	00	32	44	00
	B13	B14	B15	B16	B17	B18						
	32	54	00	32	64	00						

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.1.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE REJECT to the UE with the cause "PLMN not allowed", followed by ~~CHANNEL~~ RRC CONNECTION RELEASE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

d) The UE is soft powered down.

7.1.2.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST to the USS.

2) After step d) the USIM shall contain:

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: 234 001 (MCC MNC)
PLMN2: 234 002
PLMN3: 234 003
PLMN4: 234 004
PLMN5: 234 005
PLMN6: 234 006

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	14	00	32	24	00	32	34	00	32	44	00

	B13	B14	B15	B16	B17	B18
	32	54	00	32	64	00

or

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: 234 001 (MCC MNC)
PLMN2: 234 003
PLMN3: 234 004
PLMN4: 234 005
PLMN5: 234 006
PLMN6: 234 002

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	32	14	00	32	34	00	32	44	00	32	54	00

	B13	B14	B15	B16	B17	B18
	32	64	00	32	24	00

7.1.3 UE deleting forbidden PLMNs

7.1.3.1 Definition and applicability

In manual PLMN selection mode the UE allows location update attempts to all available PLMNs, including forbidden PLMNs (as indicated by the forbidden PLMN list on the USIM). As a result of a successful location update procedure onto a PLMN which is in the forbidden PLMN list, the forbidden PLMN list is automatically updated by the UE.

This test applies to Terminals accessing UTRAN.

7.1.3.2 Conformance requirement

1) In manual PLMN selection mode the UE shall be able to perform a LOCATION UPDATE attempt to a PLMN which is in the forbidden PLMN list.

   - TS 22.011, subclause 3.2.2.2.

2) After receipt of LOCATION UPDATE ACCEPT the UE shall delete the forbidden PLMN from the forbidden PLMN list.

   - TS 22.011, subclause 3.2.2.4.

7.1.3.3 Test purpose

1) To verify that the UE is able to perform a LOCATION UPDATE on a forbidden PLMN in manual PLMN selection mode.

2) To verify that the UE after a successful LOCATION UPDATE deletes the PLMN in the EF_{FPLMN} on the USIM.

7.1.3.4 Method of test

7.1.3.4.1 Initial conditions

The USS transmits on the BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 234/005/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

EF_{FPLMN} (Forbidden PLMNs)

Logically:	PLMN1:	empty
	PLMN2:	empty
	PLMN3:	empty
	PLMN4:	empty
	PLMN5:	234 005 (MCC MNC)
	PLMN6:	empty

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

B13	B14	B15	B16	B17	B18
32	54	00	FF	FF	FF

The UICC is installed into the Terminal and the UE is set to manual PLMN selection mode.

7.1.3.4.2 Procedure

a) The UE is powered on.

b) PLMN with MCC/MNC of 234/005 is manually selected.

c) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

d) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 234/005

TMSI: "12345678"

to the UE.

e) After receipt of TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

f) The UE is soft powered down.

7.1.3.5 Acceptance criteria

1) After step c) the UE shall send LOCATION UPDATE REQUEST to the USS.

2) After step d) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step f) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 234
LAI-MNC: 005
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	32	54	00	xx	xx	xx	00

EF_{FPLMN} (Forbidden PLMNs)

Logically: PLMN1: empty
PLMN2: empty
PLMN3: empty
PLMN4: empty
PLMN5: empty
PLMN6: empty

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Hex	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

	B13	B14	B15	B16	B17	B18
	FF	FF	FF	FF	FF	FF

7.2 User controlled PLMN selector handling

[..]

7.2.2 UE recognising the priority order of the User controlled PLMN selector list with the same access technology.

7.2.2.1 Definition and applicability

The User controlled PLMN selector list gives in priority order the preferred UPLMNs on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{PLMNwACT}$. Update and deletion of UPLMNs may be performed by the subscriber by the use of the PIN.

This test applies to Terminals accessing UTRAN.

7.2.2.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority order of the UPLMNs in the preferred list on the USIM.

- TS 22.011, subclause 3.2.2.

7.2.2.3 Test purpose

To verify that the UPLMN with the higher priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the UPLMN with the lower priority when the UE performs a network selection.

7.2.2.4 Method of test

7.2.2.4.1 Initial conditions

The USS transmits on two BCCHs, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/033/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/034/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{PLMNwACT}$ (UPLMN Selector with Access Technology)

Logically:	1st PLMN:	244 081 (MCC MNC)
	1st ACT:	UTRAN
	2nd PLMN:	244 081
	2nd ACT	GSM
	3rd PLMN:	244 082
	3rd ACT	UTRAN
	3rd PLMN:	244 082
	3rd ACT	GSM
	.....	
	.....	
	10th PLMN:	244 008
	10th ACT	UTRAN
	11th PLMN:	244 034
	11th ACT	UTRAN
	12th PLMN:	244 033

	12th ACT	UTRAN													
Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15
Hex	42	14	80	80	00	42	14	80	00	80	42	24	80	80	00
	B16	B17	B18	B19	B20	.....	.....	.....	.....						
	42	24	80	00	80	.....	.....	.....	.....						
	B46	B47	B48	B49	B50	B51	B52	B53	B54	B55	B56	B57	B58	B59	B60
	42	84	00	80	00	42	44	30	80	00	42	34	30	80	00

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.2.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/034

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.2.2.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 234/034 to the USS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 034
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	44	30	xx	xx	xx	00

7.2.3 UE recognising the priority order of the User controlled PLMN selector list using a ACT preference.

7.2.3.1 Definition and applicability

The User controlled PLMN selector list gives in priority order the preferred PLMNs of the User on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is

stored on the USIM in the $EF_{PLMNwACT}$. Update and deletion of User controlled PLMNs may be performed by the subscriber by the use of the PIN.

This test applies to a GSM/UMTS dual mode UE accessing both UTRAN and GSM using either ID-1 or Plug-in UICC.

7.2.3.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of the ACT identifier in the preferred list on the USIM. After the successful registration the Registered PLMN, the last used ACcess Technology field $EF_{RPLMNACT}$ shall be updated.

- TS 22.011, subclause 3.2.2;
- TS 31.102, subclauses 4.2.5 and 5.1.2.

7.2.3.2.1 Test purpose

To verify that the ACT with the higher priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the UPLMN with the lower priority when the UE performs a network selection and that the $EF_{RPLMNACT}$ is correct updated.

7.2.3.3 Method of test

7.2.3.3.1 Initial conditions

For this test both a GSM SS and a UTRAN USS is needed.

The GSM SS transmit on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/081/0001.
- Access control: unrestricted.

The UMTS USS transmit on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/082/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT set to UTRAN

Coding:	B1	B2
Hex	80	00

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.2.3.3.2 Procedure

a) The UE is powered on.

b) After receipt of a CHANNEL REQUEST from the UE, the SS sends IMMEDIATE ASSIGNMENT to the UE.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/081

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends CHANNEL RELEASE to the UE.

e) The UE is soft powered down.

7.2.3.4 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 244/081 to the SS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 081
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	14	80	xx	xx	xx	00

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT set to GSM

Coding:	B1	B2
Hex	00	80

7.2.4 UE recognising the priority order of the User controlled PLMN selector list using a ACT preference; accessing UTRAN

7.2.4.1 Definition and applicability

The User controlled PLMN selector list gives in priority order the preferred UPLMNs on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{PLMNwACT}$. Update and deletion of UPLMNs may be performed by the subscriber by the use of the PIN.

This test applies to Terminals accessing UTRAN. This test does not apply, if the previous test is performed.

7.2.4.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of the ACT identifier in the preferred list on the USIM. After the successful registration the Registered PLMN, the last used ACcess Technology field $EF_{RPLMNACT}$ shall be updated

- TS 22.011, subclause 3.2.2;
- TS 31.102, subclauses 4.2.5 and 5.1.2.

7.2.4.2.1 Test purpose

To verify that the ACT with the higher priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the UPLMN with the lower priority when the UE performs a network selection and that the $EF_{RPLMNACT}$ is correct updated.

7.2.4.3 Method of test

7.2.4.3.1 Initial conditions

The USS transmits on two BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/082/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/003/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT shall be set to GSM

Coding:	B1	B2
Hex	00	80

The UICCC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.2.4.3.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~RRC CONNECTION REQUEST from the UE, the SS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/082

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.2.4.4 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 244/081 to the SS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 082
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	24	80	xx	xx	xx	00

$EF_{RPLMNACT}$ (Registered PLMN last used ACcess Technology)

Logically: Last registered ACT shall be set to UTRAN

Coding:	B1	B2
Hex	80	00

7.3 Operator controlled PLMN selector handling

7.3.1 UE recognising the priority order of the Operator controlled PLMN selector list.

7.3.1.1 Definition and applicability

The Operator controlled PLMN selector list gives in priority order the preferred OPLMNs on which the UE shall register if no network of the User controlled PLMN selector list is available. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{OPLMNwACT}$. Update and deletion of OPLMNs shall not be possible by the subscriber by the use of the PIN.

This test applies to Terminals accessing UTRAN.

7.3.1.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of OPLMNs in the preferred list on the USIM.

- TS 22.011, subclause 3.2.2;
- TS 31.102, subclause 4.2.53.

7.3.1.3 Test purpose

To verify that the OPLMN with the higher priority (defined by its position in $EF_{OPLMNwACT}$) takes precedence over the OPLMN with the lower priority when the UE performs a network selection.

7.3.1.4 Method of test

7.3.1.4.1 Initial conditions

For this test a USS is needed.

The USS transmits on two BCCHs, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 254/011/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/012/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{OPLMNwACT}$ (OPLMN Selector)

Logically:	1st PLMN:	254 012 (MCC MNC)
	1st ACT	UTRAN
	2nd PLMN:	254 011
	2nd ACT	UTRAN
	3rd PLMN:	254 002
	3rd ACT:	UTRAN
	4th PLMN:	254 003
	4th ACT:	UTRAN
	5th PLMN:	254 004
	5th ACT:	UTRAN
	6th PLMN:	254 005
	6th ACT:	UTRAN
	7th PLMN:	254 006
	7th ACT:	UTRAN
	8th PLMN:	254 007
	8th ACT:	UTRAN

Coding:	B01	B02	B03	B04	B05	B06	B07	B08	B09	B10
Hex	52	24	10	80	00	52	14	10	80	00
	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20
	52	24	00	80	00	52	34	00	80	00
	B21	B22	B23	B24	B25	B26	B27	B28	B29	B30
	52	44	00	80	00	52	54	00	80	00
	B31	B32	B33	B34	B35	B36	B37	B38	B39	B40
	52	64	00	80	00	52	74	00	80	00

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.3.1.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 254/012

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.3.1.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 254/012 to the USS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 254
LAI-MNC: 012
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	52	24	10	xx	xx	xx	00

7.3.2 UE recognising the priority order of the User controlled PLMN selector over the Operator controlled PLMN selector list.

7.3.2.1 Definition and applicability

The User controlled PLMN selector list has a higher priority as the OPLMN selector list on which the UE shall register. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{PLMNwACT}$.

This test applies to Terminals accessing UTRAN.

7.3.2.2 Conformance requirement

When registering onto a VPLMN the UE shall take into account the priority of UPLMNs first before the OPLMNs in the preferred list on the USIM.

- TS 22.011, subclause 3.2.2.2;
- TS 31.102, subclauses 4.2.5 and 4.2.53.

7.3.2.3 Test purpose

To verify that the User controlled PLMN with a lower priority (defined by its position in $EF_{PLMNwACT}$) takes precedence over the OPLMN with a higher priority when the UE performs a network selection.

7.3.2.4 Method of test

7.3.2.4.1 Initial conditions

For this test a USS is needed.

The USS transmits on two BCCHs, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 254/001/0001.

- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/010/0001.
- Access control: unrestricted.

The default UICC is used.

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.3.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/010

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The UE is soft powered down.

7.3.2.5 Acceptance criteria

1) After step b) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 244/010 to the USS.

2) After step c) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 244
LAI-MNC: 010
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
	34	56	78	90	42	04	10	xx	xx	xx	00

7.4 HPLMN search handling

7.4.1 UE recognising the search period of the HPLMN

7.4.1.1 Definition and applicability

The HPLMN list gives in priority order the Home PLMN on which the UE shall register first. The HPLMN search period gives the time interval in which the UE shall search for a possible HPLMN registration.

This test applies to Terminals accessing UTRAN.

7.4.1.2 Conformance requirement

After registered onto a VPLMN the UE shall take into account the HPLMN search period timer and the priority order of the HPLMNs in the preferred list on the USIM.

- TS 22.011, subclauses 3.2.2 and 3.2.2.5.

7.4.1.3 Test purpose

To verify that the HPLMN timer is read and the HPLMN takes precedence over the VPLMN in which the UE is currently registered in.

7.4.1.4 Method of test

7.4.1.4.1 Initial conditions

For this test a UTRAN USS is needed.

The USS transmits on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/081/0001.
- Access control: unrestricted.

After the registration of UE the USS transmits on a second BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC shall be used with the following exception:

EF_{HPLMN} (HPLMN Search period)

Logically: set to 6minutes

Coding: B1
Hex 01

The UICC shall be installed into the Terminal and the UE shall be set to automatic PLMN selection mode.

7.4.1.4.2 Procedure

a) The UE shall be powered on.

b) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS shall send ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/081

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

e) The USS starts to send on the second BCCH with the MCC/MNC 246/081. An internal timer shall start to run.

f) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~ RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS. The internal timer is stopped.

g) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 246/081

TMSI: "12345678"

to the UE.

h) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends CHANNEL RELEASE to the UE.

i) The UE is soft powered down.

7.4.1.5 Acceptance criteria

1) After step e) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 246/081 to the USS.

2) After step g) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) The value of the internal timer shall not exceed 6 minutes.

NOTE: To take the systems processing time into account, the value of the internal timer may allowed to be a guard time of 1 s greater than the required 6 s.

4) After step i) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 246
LAI-MNC: 081
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	42	16	80	xx	xx	xx	00

7.4.2 GSM/UMTS dual mode UEs recognising the search period of the HPLMN

7.4.2.1 Definition and applicability

The HPLMN list gives in priority order the Home PLMN on which the UE shall register first. The Radio Access Technology identifier defines the Radio network in which the UE shall register. The list is stored on the USIM in the $EF_{HPLMNACT}$. The HPLMN search period gives the time interval in which the UE shall search for a possible HPLMN registration. To avoid a duplication of a test.

This test applies to a GSM/UMTS dual mode UE accessing both UTRAN and GSM using either ID-1 or Plug-in UICC.

To avoid a duplication of tests, this test supersede the previous test case (7.4.1).

7.4.2.2 Conformance requirement

After registered onto a VPLMN the UE shall take into account the HPLMN search period timer and the priority order of the HPLMNs in the preferred list on the USIM including the Access Technology Identifier.

- TS 22.011, subclauses 3.2.2 and 3.2.2.5.

7.4.2.3 Test purpose

To verify that the HPLMN timer is read and the HPLMN with the higher priority (defined by its position in $EF_{HPLMNwACT}$) takes precedence over the VPLMN in which the UE is currently registered in.

7.4.2.4 Method of test

7.4.2.4.1 Initial conditions

For this test both a GSM SS and a UTRAN USS is needed.

The GSM SS transmits on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 244/081/0001.
- Access control: unrestricted.

After the registration of UE the GSM SS transmits on a second BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

At the same time as the SS sends on a second BCCH, the UMTS USS transmit on BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

The default UICC is used with the following exception:

$EF_{HPLMNwACT}$ (HPLMN selector with Access Technology)

Logically: Set to MCC 246 and MNC 081
Set to UTRAN

Coding:	B1	B2	B3	B4	B5
Hex	42	16	80	80	00

EF_{HPLMN} (HPLMN Search period)

Logically: set to 6minutes

Coding:	B1
Hex	01

The UICC is installed into the Terminal and the UE is set to automatic PLMN selection mode.

7.4.2.4.2 Procedure

a) The UE is powered on.

b) After receipt of a CHANNEL REQUEST from the UE, the SS sends IMMEDIATE ASSIGNMENT to the UE.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 244/081

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends CHANNEL RELEASE to the UE.

e) The SS starts to send on the second BCCH with the MCC/MNC 246/081 and the USS starts to send with the Same MCC/MNC. An internal timer shall start to run.

f) After receipt of a ~~CHANNEL~~ RRC CONNECTION REQUEST from the UE, the USS sends ~~IMMEDIATE ASSIGNMENT~~RRC CONNECTION SETUP to the UE, followed by RRC CONNECTION SETUP COMPLETE sent by the UE to the USS. The internal timer is stopped.

g) After receipt of a LOCATION UPDATE REQUEST from the UE, the USS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 246/081

TMSI: "12345678"

to the UE.

h) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the USS sends ~~CHANNEL~~ RRC CONNECTION RELEASE to the UE, followed by RRC CONNECTION RELEASE COMPLETE sent by the UE to the USS.

i) The UE is soft powered down.

7.4.2.5 Acceptance criteria

1) After step e) the UE shall send LOCATION UPDATE REQUEST containing an MCC/MNC of 246/081 to the USS.

2) After step g) the UE shall respond with TMSI REALLOCATION COMPLETE.

3) The value of the internal timer shall not exceed 6 minutes.

NOTE: To take the systems processing time into account, the value of the internal timer may allowed to be a guard time of 1 s greater than the required 6 s.

4) After step i) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 246
LAI-MNC: 081
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	42	16	80	xx	xx	xx	00

7.5 RPLMNACT handling

7.5.1 UE recognising the last registered ACT

7.5.1.1 Definition and applicability

The RPLMNACT identifies the last Access Technology in which the UE was registered. Together with the identification of the last registered PLMN. This two lists shall be used for the network selection in the case the UE is within coverage (at switch-on) or returns to coverage of the PLMN on which it is already registered (as indicated by the registered PLMN stored in the USIM), the UE shall perform a location update to a new location area if necessary.

NOTE: According toTS 22.011 subclause 3.2.2.2, the last registered network take precedence even over the HPLMN.

This test applies to a GSM/UMTS dual mode UE accessing both UTRAN and GSM using either ID-1 or Plug-in UICC.

7.5.1.2 Conformance requirement

1) Recognising the network, in which the UE was last registered.

2) Recognising the Access Technology, in which the UE has last used.

3) AT the time of power on, from all available network the above network and Access Technology shall be first selected.

- TS 22.011, subclauses 3.2.2 and 3.2.2.2;
- TS 31.102, subclause 5.1.1.

7.5.1.3 Test purpose

To verify that the last registered network together with the last used Access technology takes precedence over all other available network.

7.5.1.4 Method of test

7.5.1.4.1 Initial conditions

For this test both a GSM SS and an UTRAN USS is needed.

The USS transmits on two BCCH, with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 246/081/0001.
- Access control: unrestricted.

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 242/001/0001.
- Access control: unrestricted.

The GSM SS transmits on the BCCH with the following network parameters:

- Attach/detach: disabled.
- LAI (MCC/MNC/LAC): 242/001/0001.
- Access control: unrestricted.

The default UICC shall be used with the following exception:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 242
LAI-MNC: 001
LAI-LAC: 9999
TMSI: "12345678"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	12	34	56	78	42	12	00	99	99	FF	00

$EF_{RPLMNACT}$ (Registered PLMN Access Technology)

Logically: set to GSM

Coding:	B1	B2
Hex	00	80

The UICC shall be installed into the Terminal and the UE shall be set to automatic PLMN selection mode.

7.5.1.4.2 Procedure

a) The UE shall be powered on.

b) After receipt of a CHANNEL REQUEST from the UE, the SS shall send IMMEDIATE ASSIGNMENT to the UE.

c) After receipt of a LOCATION UPDATE REQUEST from the UE, the SS sends LOCATION UPDATE ACCEPT with:

LAI (MCC/MNC): 242/001

LAC: 0001

TMSI: "34567890"

to the UE.

d) After receipt of a TMSI REALLOCATION COMPLETE from the UE, the SS sends CHANNEL RELEASE to the UE.

e) The UE is soft powered down.

7.5.1.5 Acceptance criteria

After step e) the USIM shall contain the following values:

EF_{LOCI} (Location Information)

Logically: LAI-MCC: 242
LAI-MNC: 001
LAI-LAC: 0001
TMSI: "34567890"

Coding:	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Hex	34	56	78	90	42	12	00	00	01	FF	00