# 8.5 MBMS Specific Procedures

## 8.5.1 MBMS Session Start

### 8.5.1.1 MBMS PTP Session Start at MCCH Acquisition in Idle mode / MBMS Selected Service

#### 8.5.1.1.1 Definition

This test is applicable for all UEs that support MBMS broadcast services.

#### 8.5.1.1.2 Conformance requirement

The UE applies the MCCH acquisition procedure to determine the MBMS services available in the cell and to initiate reception of the services that the UE has joined. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle, URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH).

…

If the variable MBMS_ACTIVATED_SERVICES is not empty, the UE shall apply the MCCH acquisition procedure upon selecting (e.g. upon power on) or re-selecting a cell supporting MBMS, upon change of MBMS controlling cell (e.g. due to an active set update or hard handover), upon entering UTRA from another RAT, upon release of a MBMS PTP RB for the purpose of changing transfer mode, upon return from loss of coverage and upon receiving an indication from upper layers that the set of activated services has changed.

…

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

When requested to acquire MBMS control information other than the MBMS ACCESS INFORMATION message , the UE shall:

> 1> if requested to start reading MCCH at the next modification period:

>> 2> start reading MCCH at the beginning of the next modification period.

> 1> otherwise

>> 2> start reading MCCH at the beginning of the next repetition period.

> 1> if requested to stop reading MCCH at the end of the modification period:

>> 2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;

>> 2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly or until the end of the modification period.

> 1> otherwise:

2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;

2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly.

NOTE 1:   The UE may combine information received at different repetition periods within a modification period.

When requested to acquire the MBMS ACCESS INFORMATION message, the UE shall:

1> if requested to start reading MCCH at the next modification period:

2> start reading MCCH at the beginning of the next modification period.

1> otherwise:

2> start reading MCCH at the beginning of the next access info period.

1> continue reading MCCH in this manner at every subsequent access info period, until the message is received correctly or until the end of the modification period.

If the UE is CELL_DCH and has a compressed mode pattern that overlaps with the period in which it needs to read MCCH, the UE may temporarily refrain from receiving MCCH unless it is capable of simultaneous operation. If the UE is CELL_FACH and has a measurement occasion that overlaps with the period in which it needs to read MCCH, the UE may temporarily refrain from receiving MCCH unless it is capable of simultaneous operation. A UE in CELL_FACH may omit performing measurements during a measurement occasion in order to receive MCCH provided that this does not prevent it from fulfilling the measurement performance requirements as specified in [19]. In Idle mode as well as in CELL_PCH and URA_PCH states the UE may temporarily refrain from receiving MCCH if needed to fulfil the measurements performance requirements as specified in [19].

NOTE 2:   The UTRAN should endeavour to ensure that for each UE in CELL_FACH the assigned measurement occasions do not overlap constantly with the periodic MCCH transmissions.

If the UE selects to another cell, the UE shall re-establish the RLC entity used for MCCH reception.

…

The UE may:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state; and

1> if not receiving an MBMS service provided via a p-t-m radio bearer:

2> monitor the MBMS notification Indicator Channel (MICH).

2> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if receiving an MBMS service that is provided via a p-t-m radio bearer; or

2> if not receiving an MBMS service that is provided via a p-t-m radio bearer and not monitoring MICH:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

> 1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

>> 2> if the UE is in idle mode:

>>> 3> indicate to upper layers that establishment of a PS signalling connection is required to receive the concerned MBMS service [5], unless the UE has already requested p-t-p RB establishment in the current modification period, and use the establishment cause set to 'MBMS ptp RB request' in the RRC connection establishment procedure.

…

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

…

> 1> if the UE performs connection establishment for MBMS ptp radio bearer request as specified in subclause 8.6.9.6; and

> 1> if one or more of the MBMS services for which the UE initiates the ptp radio bearer request concerns an MBMS Selected Service:

>> 2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the ptp radio bearer request:

>>> 3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

>>> 3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

…

In the UE, the initial direct transfer procedure shall be initiated, when the upper layers request establishment of a signalling connection. This request also includes a request for the transfer of a NAS message.

Upon initiation of the initial direct transfer procedure the UE shall:

> 1> set the variable ESTABLISHMENT_CAUSE to the cause for establishment indicated by upper layers.

Upon initiation of the initial direct transfer procedure when the UE is in idle mode, the UE shall:

> 1> perform an RRC connection establishment procedure, according to subclause 8.1.3;

> NOTE:    If an RRC connection establishment is ongoing, this procedure continues unchanged, i.e. it is not interrupted.

> 1> if the RRC connection establishment procedure was not successful:

>> 2> if the establishment cause for the failed RRC connection establishment was set to "MBMS reception" and a different cause value is stored in the variable "ESTABLISHMENT_CAUSE":

>>> 3> UE-AS (RRC) initiates a new RRC connection establishment procedure, using the establishment cause as contained in the variable ESTABLISHMENT_CAUSE.

>> 2> otherwise:

>>> 3> indicate failure to establish the signalling connection to upper layers and end the procedure.

> 1> when the RRC connection establishment procedure is completed successfully:

>> 2> continue with the initial direct transfer procedure as below.

Upon initiation of the initial direct transfer procedure when the UE is in CELL_PCH or URA_PCH state, the UE shall:

1> perform a cell update procedure, according to subclause 8.3.1, using the cause "uplink data transmission";

1> when the cell update procedure completed successfully:

2> continue with the initial direct transfer procedure as below.

The UE shall, in the INITIAL DIRECT TRANSFER message:

1> set the IE "NAS message" as received from upper layers; and

1> set the IE "CN domain identity" as indicated by the upper layers; and

1> set the IE "Intra Domain NAS Node Selector" as follows:

2> derive the IE "Intra Domain NAS Node Selector" from TMSI/PMTSI, IMSI, or IMEI; and

2> provide the coding of the IE "Intra Domain NAS Node Selector" according to the following priorities:

1.  derive the routing parameter for IDNNS from TMSI (CS domain) or PTMSI (PS domain) whenever a valid TMSI/PTMSI is available;

2.  base the routing parameter for IDNNS on IMSI when no valid TMSI/PTMSI is available;

3.  base the routing parameter for IDNNS on IMEI only if no (U)SIM is inserted in the UE.

1> if the UE, on the existing RRC connection, has received a dedicated RRC message containing the IE "Primary PLMN Identity" in the IE "CN Information Info":

2> set the IE "PLMN identity" in the INITIAL DIRECT TRANSFER message to the latest PLMN information received via dedicated RRC signalling. If NAS has indicated the PLMN towards which a signalling connection is requested, and this PLMN is not in agreement with the latest PLMN information received via dedicated RRC signalling, then the initial direct transfer procedure shall be aborted, and NAS shall be informed.

1> if the UE, on the existing RRC connection, has not received a dedicated RRC message containing the IE "CN Information Info" , and if the IE "Multiple PLMN List" was broadcast in the cell where the current RRC connection was established:

2> set the IE "PLMN identity" in the INITIAL DIRECT TRANSFER message to the PLMN chosen by higher layers [5, 25] amongst the PLMNs in the IE "Multiple PLMN List" broadcast in the cell where the RRC connection was established.

1> if the IE "Activated service list" within variable MBMS_ACTIVATED_SERVICES includes one or more MBMS services with the IE "Service type" set to "Multicast" and;

1> if the IE "CN domain identity" as indicated by the upper layers is set to "CS domain" and;

1> if the variable ESTABLISHED_SIGNALLING_CONNECTIONS does not include the CN domain identity 'PS domain':

2> include the IE "MBMS joined information";

2> include the IE "P-TMSI" within the IE "MBMS joined information" if a valid PTMSI is available.

1> if the variable ESTABLISHMENT_CAUSE_ is initialised:

2> set the IE "Establishment cause" to the value of the variable ESTABLISHMENT_CAUSE;

2> clear the variable ESTABLISHMENT_CAUSE.

1> calculate the START according to subclause 8.5.9 for the CN domain as set in the IE "CN Domain Identity"; and

1> include the calculated START value for that CN domain in the IE "START".

The UE shall:

1> transmit the INITIAL DIRECT TRANSFER message on the uplink DCCH using AM RLC on signalling radio bearer RB3;

1> when the INITIAL DIRECT TRANSFER message has been submitted to lower layers for transmission:

2> confirm the establishment of a signalling connection to upper layers; and

2> add the signalling connection with the identity indicated by the IE "CN domain identity" in the variable ESTABLISHED_SIGNALLING_CONNECTIONS.

1> when the successful delivery of the INITIAL DIRECT TRANSFER message has been confirmed by RLC:

2> the procedure ends.

When not stated otherwise elsewhere, the UE may also initiate the initial direct transfer procedure when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected.

A new signalling connection request may be received from upper layers during transition to idle mode. In those cases, from the time of the indication of release to upper layers until the UE has entered idle mode, any such upper layer request to establish a new signalling connection shall be queued. This request shall be processed after the UE has entered idle mode.

…

The UE shall:

1> if the IE "Secondary CCPCH system information MBMS" is included:

2> apply the Secondary CCPCH and FACH indicated by the IE "FACH carrying MCCH" for receiving MCCH.

1> otherwise, if the IE "Secondary CCPCH system information" includes the IE "MCCH configuration information":

2> apply the Secondary CCPCH and FACH indicated by the IE "MCCH configuration information" for receiving MCCH.

…

The UE shall select the Secondary CCPCH for acquiring MCCH information according to the following rules:

1> if System Information Block type 5 or System Information Block type 5bis is defined and includes an S-CCPCH within the IE "Secondary CCPCH system information" including a FACH for which the IE "MCCH configuration information" is included:

2> select that S-CCPCH and FACH for receiving MCCH.

1> otherwise if System Information Block type 5 or System Information Block type 5bis is defined and includes an SCCPCH within the IE "Secondary CCPCH system information MBMS" for which the IE "FACH carrying MCCH" is included:

2> select that S-CCPCH and FACH for receiving MCCH.

Reference

3GPP TS 25.331 clauses 8.7.2, 8.7.1.3, 8.7.3.3.1, 8.6.9.6, 8.1.3.3, 8.1.8.2, 8.1.1.6.5, 8.5.19a.

8.5.1.1.3 Test purpose

To verify that the UE receives the MBMS info in idle mode state and to verify that the UE starts the reception of MBMS services at MCCH acquisition.

8.5.1.1.4 Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 22.

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No.

Test procedure

**Table 8.5.1.1**

| Parameter | Unit | Cell 21 | | Cell 22 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | OFF | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBM | -60 | OFF | -70 | -60 |

Table 8.5.1.1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution.

1) The UE is camping on cell 21, the SS configures its downlink transmission power settings according to columns "T1" in table 8.5.1.1, the UE re-selects to cell 22 supporting MBMS (MBMS_ACTIVATED_SERVICES is not empty). The SS transmits SYSTEM INFORMATION BLOCK TYPE 5 or 5bis messages including the MCCH configuration specified within the IE "Secondary CCPCH system information" (there is only one S-CCPCH in this cell, SS uses S-CCPCH combination from TS34.108 clause 6.10.2.4.3.9 Interactive/Background 32 kbps RAB + SRB for PCCH + SRB for CCCH + SRB for DCCH + SRB for BCCH + SRB for MCCH) mapped on to an S-CCPCH also used for non-MBMS purposes. The UE shall perform the MCCH acquisition procedure:

2) The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION, the MBMS UNMODIFIED SERVICES INFORMATION (including both IEs "MBMS required UE action" set to "Request PTP RB") and the MBMS GENERAL INFORMATION.

3) The UE shall request a p-t-p RB establishment.

4) The SS transmits a RADIO BEARER SETUP message to the UE. This message requests the establishment of a radio access bearer. The UE shall establish this radio bearer. Then the UE transmits a RADIO BEARER SETUP COMPLETE message using AM RLC.

5) SS calls for generic procedure C.3 to check that UE is in CELL_DCH state.

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| | | | | The UE re-selects to cell 22 supporting MBMS (MBMS service already activated). |
| 1 | | ← | SYSTEM INFORMATION BLOCK TYPE 5 / SYSTEM INFORMATION BLOCK TYPE 5bis | |
| 2 | | ← | MBMS MODIFIED SERVICES INFORMATION | |
| 3 | | | | The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information in the same modification period. |
| 4 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 5 | | ← | MBMS GENERAL INFORMATION | |

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 6 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 7 | ← | | RRC CONNECTION SETUP | RRC state indicator set to Cell_FACH |
| 8 | → | | RRC CONNECTION SETUP COMPLETE | |
| 8a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC Connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 8 and before step 14. |
| 9 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 10 | ← | | SECURITY MODE COMMAND | |
| 11 | → | | SECURITY MODE COMPLETE | |
| 12 | ← | | RADIO BEARER SETUP | |
| 13 | → | | RADIO BEARER SETUP COMPLETE | |
| 14 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity (different from the MBMS activated service) |
| - MBMS required UE action | request PTP RB |

MBMS UNMODIFIED SERVICES INFORMATION (Step 4)

| Information Element | Value/remark |
|---------------------|--------------|
| Unmodified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Request PTP RB |

RRC CONNECTION REQUEST (Step 6)

| Information Element | Value/remark |
|---------------------|--------------|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI |
| Establishment Cause | MBMS ptp RB request |
| Domain indicator | PS domain |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RRC CONNECTION SETUP (Step 7)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Set to same value as received in Step 6 |
| RRC State Indicator | Cell_FACH |

MBMS MODIFICATION REQUEST (Step 8a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
| - MBMS Selected Services Full | |
| - MBMS Selected Service ID | Only 1 entry |
| - MBMS Service ID | MBMS service ID of the activated MBMS service |
| - CHOICE PLMN identity | Check to see that one of the below choice element is present |
| - SameAs-MIB | (no data) |
| - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

RADIO BEARER SETUP (Step 12)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9, with the condition B2.

SYSTEM INFORMATION BLOCK TYPE 5 and 5bis (Step1)

As specified in TS 34.108 clause 6.1 and by using condition M2 for SYSTEM INFORMATION BLOCK TYPE 5 message.

### 8.5.1.1.5 Test requirements

After step 2, after the UE has received a MBMS modified services Information message, the UE continues acquiring the MBMS informations.

At step 4, after the UE has received an MBMS unmodified services Information message including the IE "MBMS required UE action" set to Request PTP RB, the UE shall indicate to upper layers that the establishment of an RRC connection is required to receive the concerned MBMS service with the establishment cause set to "MBMS ptp RB request".

At step 13, the UE shall send a RADIO BEARER SETUP COMPLETE message.

## 8.5.1.1m MBMS PTP Session Start at MCCH Acquisition in Idle mode / MBMS Multicast Service

### 8.5.1.1m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.1.1m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.1.2 except there is no reference to 3GPP TS 25.331 clause 8.1.3.3.

Reference

3GPP TS 25.331 clauses 8.7.2, 8.7.1.3, 8.7.3.3.1, 8.6.9.6, 8.1.8.2, 8.1.1.6.5, 8.5.19a.

### 8.5.1.1m.3 Test purpose

Same test purpose as in clause 8.5.1.1.3.

8.5.1.1m.4                    Method of test

Initial condition

System Simulator:

    2 MBMS cells, Cell 21 and Cell 22.

User Equipment:

    The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

    The UE has joined the multicast service to be provided by the SS (included in
    MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

    - MBMS Multicast service application available on UE          Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.1.4.

Expected sequence

Same expected sequence as in clause 8.5.1.1.4 except for RRC CONNECTION REQUEST message content (step 6) and MODIFICATION REQUEST procedure not required.

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | **UE** | **SS** | | |
| | | | | The UE re-selects to cell 22 supporting MBMS (MBMS service already activated). |
| 1 | ← | | SYSTEM INFORMATION BLOCK TYPE 5 / SYSTEM INFORMATION BLOCK TYPE 5bis | |
| 2 | ← | | MBMS MODIFIED SERVICES INFORMATION | |
| 3 | | | | The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information in the same modification period. |
| 4 | ← | | MBMS GENERAL INFORMATION | |
| 5 | ← | | MBMS UNMODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 6 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request". |
| 7 | ← | | RRC CONNECTION SETUP | RRC state indicator set to Cell_FACH |
| 8 | → | | RRC CONNECTION SETUP COMPLETE | |
| 9 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Multicast service Reception". |
| 10 | ← | | SECURITY MODE COMMAND | |
| 11 | → | | SECURITY MODE COMPLETE | |
| 12 | ← | | RADIO BEARER SETUP | |
| 13 | → | | RADIO BEARER SETUP COMPLETE | |
| 14 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.1.1.4 except for RRC CONNECTION REQUEST message content (step 6).

RRC CONNECTION REQUEST (Step 6)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI |
| Establishment Cause | MBMS ptp RB request |
| Domain indicator | PS domain |

### 8.5.1.1m.5 Test requirements

Same test requirement as in clause 8.5.1.1.5.

## 8.5.1.2 MBMS PTP Session Start at MCCH Notification in CELL_PCH / MBMS Selected Service

### 8.5.1.2.1 Definition

This test is applicable for all UEs that support MBMS broadcast services.

### 8.5.1.2.2 Conformance requirement

The MBMS notification procedure is used by the UE to respond to a notification provided by UTRAN, indicating a change applicable for one or more MBMS services the UE has joined. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle and connected mode: URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH). The actual notification mechanism to be used depends on the UE state.

…

The UE shall:

    1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

        2> if receiving an MBMS service that is provided via a p-t-m radio bearer; or

        2> if not receiving an MBMS service that is provided via a p-t-m radio bearer and not monitoring MICH:

            3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

            3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

….

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

    1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

        …

        2> if the UE is in URA_PCH, Cell_PCH, or CELL_FACH states:

            3> perform a cell update procedure with cause "MBMS ptp RB request", as specified in subclause 8.3.1.2, unless the UE has already requested p-t-p RB establishment in the current modification period.

…

A UE shall initiate the cell update procedure in the following cases:

....

    1> MBMS ptp RB request:

        2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and

2> if the UE is in URA_PCH, Cell_PCH or Cell_FACH state; and

2> if the UE should perform cell update for MBMS ptp radio bearer request as specified in 8.6.9.6:

3> perform cell update using the cause "MBMS ptp RB request".

…

The UE shall set the IEs in the CELL UPDATE message as follows:

…

1> if the UE performs cell update for MBMS ptp radio bearer request as specified in subclause 8.6.9.6; and

1> if one or more of the MBMS services for which the UE initiates the ptp radio bearer request concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates ptp radio bearer request:

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> otherwise, if the UE performs cell update for MBMS counting as specified in subclause 8.7.4; and

1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> if the UE included one or more "MBMS Selected Service ID" IEs:

2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

Reference

3GPP TS 25.331 clauses 8.7.3.1, 8.7.3.3.1, 8.6.9.6, 8.3.1.2, 8.3.1.3.

### 8.5.1.2.3          Test purpose

To verify that the UE in Cell_PCH state, correctly handle the Notification procedure after receiving the MODIFIED SERVICES INFORMATION message via MCCH.

### 8.5.1.2.4          Method of test

Initial condition

System Simulator:

1 MBMS cell

User Equipment:

The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-   MBMS Broadcast service application available on UE    Yes/No.

Test procedure

1) The UE in Cell_PCH, shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION including the IE "MBMS required UE action" set to "Request PTP RB".

2) The UE shall perform a cell update procedure with cause "MBMS ptp RB request". The UE transmits a CELL UPDATE message including the IE "MBMS Selected Service ID" of the concerned MBMS Selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----------|------|---------|----------|
| | UE | SS | | |
| | | | | The UE is in Cell_PCH state. |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB". |
| 2 | → | | CELL UPDATE | The UE enters the CELL_FACH state. UE performs cell update procedure. The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS ptp RB request" and the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 3 | | ← | CELL UPDATE CONFIRM | |
| 3a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |
| 4 | | ← | RADIO BEARER SETUP | |
| 5 | → | | RADIO BEARER SETUP COMPLETE | |
| 5a | → | | MBMS MODIFICATION REQUEST | This message may be received at any point after step 4 and before step 6. |
| 6 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|--------------------|--------------|
| Modified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | request PTP RB |

CELL UPDATE (Step 2)

| Information Element | Value/remark |
|--------------------|--------------|
| Cell update cause | MBMS ptp RB request |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has activated |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

CELL UPDATE CONFIRM (Step 3)

| Information Element | Value/remark |
|---|---|
| New C-RNTI | '1010 1010 1010 1010' |
| | |

RADIO BEARER SETUP (Step 4)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9, with the condition B4.

MBMS MODIFICATION REQUEST (step 5a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
| - MBMS Selected Services Full | |
| - MBMS Selected Service ID | |
| - MBMS Service ID | MBMS service ID of the activated MBMS service |
| - CHOICE PLMN identity | Check to see that one of the below choice element is present |
| - SameAs-MIB | (no data) |
| - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

### 8.5.1.2.5 Test requirements

At step 2, the UE shall initiate a cell update procedure for MBMS ptp radio bearer request.

## 8.5.1.2m MBMS PTP Session Start at MCCH Notification in CELL_PCH / MBMS Multicast Service

### 8.5.1.2m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.1.2m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.2.2 except there is no reference to 3GPP TS 25.331 clause 8.3.1.3.

### 8.5.1.2m.3 Test purpose

Same test purpose as in clause 8.5.1.2.3.

### 8.5.1.2m.4 Method of test

Initial condition

System Simulator:

    1 MBMS cell

User Equipment:

    The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

    The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-    MBMS Multicast service application available on UE       Yes/No.

Test procedure

1) The UE in Cell_PCH, shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION including the IE "MBMS required UE action" set to "Request PTP RB".

2) The UE shall perform a cell update procedure with cause "MBMS ptp RB request".

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| | | | | The UE is in Cell_PCH state. |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB". |
| 2 | → | | CELL UPDATE | The UE enters the CELL_FACH state. UE performs cell update procedure. The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS ptp RB request" |
| 3 | ← | | CELL UPDATE CONFIRM | |
| 4 | ← | | RADIO BEARER SETUP | |
| 5 | → | | RADIO BEARER SETUP COMPLETE | |
| 6 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.1.2.4 except for CELL UPDATE message content (step 2).

CELL UPDATE (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| Cell update cause | MBMS ptp RB request |

8.5.1.2m.5 Test requirements

Same test requirement as in clause 8.5.1.2.5.

## 8.5.1.3 MBMS PTM Session Start at MCCH Acquisition in CELL_FACH state / MBMS Broadcast Service

### 8.5.1.3.1 Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services.

### 8.5.1.3.2 Conformance requirement

If the variable MBMS_ACTIVATED_SERVICES is not empty, the UE shall apply the MCCH acquisition procedure upon selecting (e.g. upon power on) or re-selecting a cell supporting MBMS, upon change of MBMS controlling cell (e.g. due to an active set update or hard handover), upon entering UTRA from another RAT, upon release of a MBMS PTP RB for the purpose of changing transfer mode, upon return from loss of coverage and upon receiving an indication from upper layers that the set of activated services has changed.

…

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION

messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

> 1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

> 1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

>> 2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

>> 2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

### Reference

3GPP TS 25.331 clauses 8.7.2.2, 8.7.2.3, 8.6.9.6.

#### 8.5.1.3.3 Test purpose

1. To verify that the UE receives the MBMS information on MCCH in CELL_FACH state.

2. To verify that the UE correctly handles the notification procedure after receiving the MBMS MODIFIED SERVICES INFORMATION message via MCCH if no ongoing MBMS p-t-m session (MICH supported/not supported by the UE).

3. To verify that the UE starts the reception of MBMS services according to notification via MICH/MCCH when the UE is in CELL_FACH state.

#### 8.5.1.3.4 Method of test

### Initial Condition

System Simulator:

   2 MBMS cells, Cell 21 and Cell 22.

User Equipment:

   The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

   The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

### Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

Test Procedure

**Table 8.5.1.3**

| Parameter | Unit | Cell 21 | | Cell 22 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | OFF | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBM | -60 | OFF | -70 | -60 |

Table 8.5.1.3 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution.

The UE is in the CELL_FACH state in Cell 21 and is interested in the broadcast service to be provided by the SS.

The SS applies the power settings of "T1" in table 8.5.1.3. The UE shall reselect to Cell 22 and send a CELL UPDATE message. The UE shall perform the MCCH acquisition procedure. The UE shall continue acquiring the MBMS information messages until it has received a consistent set of MCCH information. The UE received an MBMS UNMODIFIED SERVICES INFORMATION message including IE "MBMS required UE action" set to "Acquire PTM RB info".

The SS waits for the UE to start reception of the MBMS data on MTCH.

The MBMS radio bearer on MTCH is put into loopback mode 3.

The SS sends 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer, then retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.2 to check that UE is in CELL_FACH state.

Expected sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| | | | | The UE is in Cell_FACH in Cell 21 |
| 1 | ← | | ACTIVATE RB TEST MODE | |
| 2 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| | | | | SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.5-1. |
| 3 | → | | CELL UPDATE | This message is transmitted in Cell 22 |
| 4 | ← | | CELL UPDATE CONFIRM | |
| 5 | ← | | MBMS UNMODIFIED SERVICES INFORMATION | MBMS required UE action set to 'Acquire PTM info' |
| 6 | ← | | CLOSE UE TEST LOOP | |
| 7 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 8 | | SS | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 9 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 10 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data. |
| 11 | ← | | OPEN UE TEST LOOP | |
| 12 | → | | OPEN UE TEST LOOP COMPLETE | |
| 13 | ←→ | | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific Message Contents

MBMS UNMODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark |
|---|---|
| Unmodified service list | |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 10)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

8.5.1.3.5          Test requirement

After step 9, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

# 8.5.1.3m     MBMS PTM Session Start at MCCH Acquisition in CELL_FACH state / MBMS Multicast Service

8.5.1.3m.1          Definition

This test is applicable for all UEs that support MBMS multicast services.

8.5.1.3m.2          Conformance requirement

Same conformance requirement as in clause 8.5.1.3.2.

8.5.1.3m.3          Test purpose

Same test purpose as in clause 8.5.1.3.3.

8.5.1.3m.4          Method of test

Initial condition

System Simulator:

      2 MBMS cells, Cell 21 and Cell 22.

User Equipment:

      The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

      The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-      MBMS Multicast service application available on UE          Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.3.4.

Specific message contents

Same specific messages contents as in clause 8.5.1.3.4.

8.5.1.3m.5          Test requirements

Same test requirement as in clause 8.5.1.3.5.

## 8.5.1.4 MBMS PTM Session Start at MCCH Notification in CELL_DCH state / MBMS Broadcast Service

### 8.5.1.4.1 Definition

This test case is applicable for all UEs that support MBMS broadcast services and support MBMS p-t-m reception in CELL_DCH state.

### 8.5.1.4.2 Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

Reference

3GPP TS 25.331 clauses 8.7.2.3, 8.7.3.3.1, 8.6.9.6.

### 8.5.1.4.3 Test purpose

1  To verify that the UE handles reading of MCCH during compressed mode measurements in CELL_DCH state if the UE requires compressed mode.

2.  To verify that the UE correctly handles the notification procedure after receiving the MBMS MODIFIED SERVICES INFORMATION message via MCCH in CELL_DCH state.

3.  To verify that the UE starts the p-t-m reception of MBMS services according to notification via MCCH when the UE is in CELL_DCH state.

### 8.5.1.4.4 Method of test

Initial Condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 24

User Equipment:

The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

- UE supports MBMS p-t-m reception in CELL_DCH state    Yes/No

- Compressed mode required    Yes/No

Test Procedure

**Table 8.5.1.4**

| Parameter | Unit | Cell 21 | | Cell 24 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -70 | -70 | -60 |

The UE is in the CELL_DCH state in cell 21 and has selected the broadcast service to be provided by the SS.

The SS configures then compressed mode (if required), to prepare the UE for inter-frequency measurements, by sending a PHYSICAL CHANNEL RECONFIGURATION message on DCCH using AM-RLC. The UE shall answer with a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

The SS then sets up inter-frequency measurements (event 2b), by sending a MEASUREMENT CONTROL message to the UE. Compressed mode is started at the same time in that message (if required).

The SS notifies on MCCH about the start of an MBMS session. The SS waits for the UE to start reception of the MBMS data on MTCH and then the MBMS radio bearer on MTCH is put into loopback mode 3.

The SS sends 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. The SS then applies the power settings according to column "T1" in table 8.5.1.4. The UE transmits a MEASUREMENT REPORT message to the SS.

The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.3 to check that UE is in CELL_DCH state.

NOTE:    If the UE fails the test because of a failure to reselect to a right cell, then the operator may re-run the test.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|------|---------|---------|
| | UE | SS | | |
| 1 | ← | | ACTIVATE RB TEST MODE | |
| 2 | → | | ACTIVATE RB TEST MODE COMPLETE | If compressed mode is not required (refer ICS/IXIT), goto step 5. |
| 3 | ← | | PHYSICAL CHANNEL RECONFIGURATION | The SS downloads the compressed mode parameters in the UE. |
| 4 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE acknowledges the downloading of the compressed mode parameters. |
| 5 | ← | | MEASUREMENT CONTROL | The SS configures inter-frequency measurements in the UE, and If compressed mode is required (refer ICS/IXIT) activates compressed mode. |
| 6 | ← | | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. |
| 7 | SS | | | The SS waits for the UE to start MTCH reception according to the activation time. |
| 8 | ← | | CLOSE UE TEST LOOP | |
| 9 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 10 | SS | | | The SS sends 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 11 | | | | The SS changes the power of the cells according to column T1 in table 8.5.1.4. |
| 12 | → | | MEASUREMENT REPORT | Cell 24 triggers event 2b in the UE, which sends a MEASUREMENT REPORT message to the SS. |
| 13 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 14 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data. |
| 15 | ← | | OPEN UE TEST LOOP | |
| 16 | → | | OPEN UE TEST LOOP COMPLETE | |
| 17 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific Message Contents

PHYSICAL CHANNEL RECONFIGURATION (Step 3)

The contents of PHYSICAL CHANNEL RECONFIGURATION message in this test case is identical to the message sub-type titled as "Packet to CELL_DCH from CELL_DCH in PS" as found in [9] TS 34.108 clause 9, with the following exceptions:

| Information Element | Value/Remark | Version |
|---|---|---|
| Downlink information common for all radio links | | |
| - Downlink DPCH info common for all RL | Not Present | |
| - DPCH compressed mode info | | |
| - TGPSI | 1 | |
| - TGPS Status Flag | Deactivate | |
| - TGCFN | Not present | |
| - Transmission gap pattern sequence configuration parameters | | |
| - TGMP | FDD Measurement | |
| - TGPRC | Infinity | |
| - TGSN | 8 | |
| - TGL1 | 14 | |
| - TGL2 | Not Present | |
| - TGD | undefined | |
| - TGPL1 | 4 | |
| - RPP | Mode 0 | |
| - ITP | Mode 0 | |
| - CHOICE UL/DL Mode | UL and DL, UL only or DL only (depending on the UE capability) | |
| - Downlink compressed mode method | SF/2 | |
| - Uplink compressed mode method | SF/2 | |
| - Downlink frame type | 11B | |
| - DeltaSIR1 | 20 (2.0) | |
| - DeltaSIRAfter1 | 10 (1.0) | |
| - DeltaSIR2 | Not Present | |
| - DeltaSIRAfter2 | Not Present | |
| - N identify abort | Not Present | |
| - T Reconfirm abort | Not Present | |
| - TX Diversity mode | Not Present | |
| - Default DPCH Offset Value | Not Present | |
| Downlink information per radio link list | | |
| - Choice mode | FDD | |
| - Primary CPICH info | | |
| - Primary scrambling code | Ref. to the Default setting in clause 6.1 (FDD) | |
| - PDSCH with SHO DCH info | Not Present | R99 and Rel-4 only |
| - PDSCH code mapping | Not Present | R99 and Rel-4 only |
| - Serving HS-DSCH radio link indicator | FALSE | Rel-5 |
| - Serving E-DCH radio link indicator | FALSE | Rel-6 |
| - Downlink DPCH info for each RL | | |
| - CHOICE mode | FDD | |
| - Primary CPICH usage for channel estimation | Primary CPICH may be used | |
| - DPCH frame offset | Set to value : Default DPCH Offset Value (as currently stored in SS) mod 38 400 | |
| - Secondary CPICH info | Not Present | |
| - DL channelisation code | | |
| - Secondary scrambling code | 5 | |
| - Spreading factor | Reference to clause 6.10 Parameter Set | |
| - Code number | 0 | |
| - Scrambling code change | Set to value default1: No code change (if the UE has a compressed mode pattern sequence configured in variable TGPS_IDENTITY or included in the message including IE "Downlink DPCH info for each RL", which is using compressed mode method "SF/2") | |

| | | |
|---|---|---|
| - TPC combination index | 0 | |
| - SSDT Cell Identity | Not Present | R99 and Rel-4 only |
| - Closed loop timing adjustment mode | Not Present | |
| - E-AGCH Info | Not Present | Rel-6 |
| - E-HICH Information | Not Present | Rel-6 |
| - E-RGCH Information | Not Present | Rel-6 |
| - SCCPCH information for FACH | Not Present | R99 and Rel-4 only |

MEASUREMENT CONTROL (Step 5)(FDD)

| Information Element | Value/Remark |
|---|---|
| Measurement Identity | 2 |
| Measurement Command | Setup |
| Measurement Reporting Mode | |
| - Measurement Reporting Transfer Mode | Acknowledged Mode RLC |
| - Periodical Reporting / Event Trigger Reporting Mode | Event Trigger |
| Additional measurements list | Not Present |
| CHOICE measurement type | Inter-frequency measurement |
| - Inter-frequency cell info list | |
| - CHOICE inter-frequency cell removal | No inter-frequency cells removed |
| - New inter-frequency info list | 1 inter-frequency cell |
| - Inter-frequency cell id | 24 |
| - Frequency info | Set to the frequency of cell 24 |
| - Cell info | |
| - Cell individual offset | 0 (0 dB) |
| - Reference time difference to cell | Not present |
| - Read SFN Indicator | FALSE |
| - CHOICE Mode | FDD |
| - Primary CPICH Info | |
| - Primary Scrambling Code | Scrambling code of cell 24 |
| - Primary CPICH TX power | Not Present |
| - TX Diversity Indicator | FALSE |
| - Cells for measurement | Not present |
| - Inter-frequency measurement quantity | |
| - CHOICE reporting criteria | Inter-frequency reporting criteria |
| - Filter Coefficient | 0 |
| - Measurement quantity for frequency quality estimate | CPICH RSCP |
| - Inter-frequency reporting quantity | |
| - UTRA Carrier RSSI | FALSE |
| - Frequency quality estimate | FALSE |
| - Non frequency related cell reporting quantities | |
| - SFN-SFN observed time difference reporting indicator | No report |
| - Cell synchronisation information reporting indicator | FALSE |
| - Cell Identity reporting indicator | FALSE |
| - CPICH Ec/No reporting indicator | TRUE |
| - CPICH RSCP reporting indicator | TRUE |
| - Pathloss reporting indicator | FALSE |
| - Measurement validity | |
| - UE State | CELL_DCH |
| - Inter-frequency set update | |
| - UE autonomous update | On with no reporting |
| - Non autonomous update mode | Not present |
| - CHOICE report criteria | Inter-frequency measurement reporting criteria |
| - Parameters required for each event | |
| - Inter-frequency event identity | 2b |
| - Threshold used frequency | -65 dBm |
| - W used frequency | 0 (0.0) |
| - Hysteresis | 2 (1.0 dB) |
| - Time to trigger | 100 ms |
| - Reporting cell status | Report cells within monitored and/or virtual active set on non-used frequency |
| - Maximum number of reported cells per reported non-used frequency | 1 |
| - Parameters required for each non-used frequency | |
| - Threshold non used frequency | -65 dBm |
| - W non-used frequency | 0 |
| DPCH compressed mode status info | If the UE requires compressed mode (refer ICS/IXIT), this IE is present and contains the IEs as follows. If the UE does not require compressed mode (refer ICS/IXIT), this IE is not present. |

| Information Element | Value/Remark |
|---|---|
| - TGPS reconfiguration CFN | ((Current CFN + (256 – TTI/10msec))mod 256 |
| - Transmission gap pattern sequence | |
|   - TGPSI | 1 |
|   - TGPS Status Flag | Activate |
|   - TGCFN | (Current CFN + (256 – TTI/10msec))mod 256 |

MEASUREMENT CONTROL (Step 5)( 3.84Mcps, 1.28Mcps and 7.68Mcps TDD)

| Information Element | Value/Remark |
|---|---|
| Measurement Identity | 2 |
| Measurement Command | Setup |
| Measurement Reporting Mode | |
|   - Measurement Reporting Transfer Mode | Acknowledged Mode RLC |
|   - Periodical Reporting / Event Trigger Reporting Mode | Event Trigger |
| Additional measurements list | Not Present |
| CHOICE measurement type | Inter-frequency measurement |
|   - Inter-frequency cell info list | |
|    - CHOICE inter-frequency cell removal | No inter-frequency cells removed |
|    - New inter-frequency info list | 1 inter-frequency cell |
|    - Inter-frequency cell id | 24 |
|    - Frequency info | Set to the frequency of cell 24 |
|    - Cell info | |
|    - Cell individual offset | 0 (0 dB) |
|    - Reference time difference to cell | Not present |
|    - Read SFN Indicator | FALSE |
|    - CHOICE Mode | TDD |
|    - Primary CCPCH Info | |
|     - CHOICE Mode | TDD |
|     - CHOICE TDD option | 1.28Mcps TDD |
|     -TSTD indicator | FALSE |
|     - Cell parameters ID | Set to same code as used for cell 24 |
|     - SCTD indicator | FALSE |
|    - Primary CCPCH Tx power | Not present |
|    - Timeslot list | Not present |
|    - Cells for measurement | Not present |
|   - Inter-frequency measurement quantity | |
|   - CHOICE reporting criteria | Inter-frequency reporting criteria |
|   - Filter Coefficient | 0 |
|   - Measurement quantity for frequency quality estimate | PCCPCH RSCP |
|   - Inter-frequency reporting quantity | |
|   - UTRA Carrier RSSI | FALSE |
|   - Frequency quality estimate | FALSE |
|   - Non frequency related cell reporting quantities | |
|   - SFN-SFN observed time difference reporting indicator | No report |
|   - Cell synchronisation information reporting indicator | FALSE |
|   - Cell Identity reporting indicator | FALSE |
|   - CHOICE mode | TDD |
|   - Timeslot ISCP reporting indicator | FALSE |
|   - Proposed TGSN Reporting required | FALSE |
|   - Primary CCPCH RSCP reporting indicator | TRUE |
|   - Pathloss reporting indicator | FALSE |
|   - Measurement validity | |
|   - UE State | CELL_DCH |
|   - Inter-frequency set update | Not present |
|   - CHOICE report criteria | Inter-frequency measurement reporting criteria |
|   - Parameters required for each event | |
|   - Inter-frequency event identity | 2b |
|   - Threshold used frequency | -65 dBm |
|   - W used frequency | 0 (0.0) |
|   - Hysteresis | 2 (1.0 dB) |
|   - Time to trigger | 100 ms |
|   - Reporting cell status | Report cells within monitored and/or virtual active set on non-used frequency |
|   - Maximum number of reported cells per reported non-used frequency | 1 |
|   - Parameters required for each non-used frequency | |
|   - Threshold non used frequency | -65 dBm |
|   - W non-used frequency | 0.0 |
| DPCH compressed mode status info | Not Present |

MEASUREMENT REPORT (Step 12)(FDD)

| Information Element | Value/Remark |
|---|---|
| Message Type | |
| Integrity check info | |
|   - Message authentication code | This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC Message sequence number | This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value. |
| Measurement identity | 2 |
| Measured Results | |
|   - Inter-frequency measured results list | |
|    - Frequency info | |
|     - UARFCN uplink | The presence of this IE is not checked |
|     - UARFCN downlink | Check that the value of this IE is set to the downlink UARFN of cell 24 |
|   - UTRA carrier RSSI | Check that this IE is absent |
|   - Inter-frequency cell measurement results | Check that the value of this IE is set to 1 cell reported |
|    - Cell measured results | |
|    - Cell Identity | Check that this IE is absent |
|    - SFN-SFN observed time difference | Check that this IE is absent |
|    - Cell synchronisation information | Check that this IE is absent |
|    - Primary CPICH info | |
|    - Primary scrambling code | Check that the value of this IE is set to Scrambling code of cell 24 |
|    - CPICH Ec/N0 | Check that this IE is present |
|    - CPICH RSCP | Check that this IE is present |
|    - Pathloss | Check that this IE is absent |
| Measured results on RACH | Check that this IE is absent |
| Additional measured results | Check that this IE is absent |
| Event results | |
|   - Inter-frequency measurement event results | |
|    - Inter-frequency event identity | 2b |
|    - Inter-frequency cells | |
|     - Frequency info | |
|     - UARFCN uplink | The presence of this IE is not checked |
|     - UARFCN downlink | Check that the value of this IE is set to the downlink UARFN of cell 24 |
|    - Non freq related measurement event results | |
|     - Primary CPICH info | |
|     - Primary scrambling code | Check that the value of this IE is set to Scrambling code of cell 24 |

MEASUREMENT REPORT (Step 12) (1.28Mcps TDD)

| Information Element | Value/Remark |
|---|---|
| Message Type | |
| Integrity check info | |
|   - Message authentication code | This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC Message sequence number | This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value. |
| Measurement identity | 2 |
| Measured Results | |
|   - Inter-frequency measured results list | |
|   - Frequency info | |
|    - CHOICE mode | TDD |
|     - UARFCN | Check that the value of this IE is set to the UARFN of cell 24 |
|   - UTRA carrier RSSI | Check that this IE is absent |
|   - Inter-frequency cell measurement results | Check that the value of this IE is set to 1 cell reported |
|   - Cell measured results | |
|   - Cell Identity | Check that this IE is absent |
|   - SFN-SFN observed time difference | Check that this IE is absent |
|   - Cell synchronisation information | Check that this IE is absent |
|   - CHOICE mode | TDD |
|   - Cell parameters Id | Check to see if it's the same for cell 24 |
|   - Proposed TGSN | Check that this IE is absent |
|   - Primary CCPCH Info | Check that this IE is present |
|    - PCCPCH RSCP | Check that this IE is present |
|   - Pathloss | Check that this IE is absent |
|   - Timeslot list | Check that this IE is absent |
| Measured results on RACH | Check that this IE is absent |
| Additional measured results | Check that this IE is absent |
| Event results | |
|   - Inter-frequency measurement event results | |
|   - Inter-frequency event identity | 2b |
|   - Inter-frequency cells | |
|   - Frequency info | |
|   - UARFCN | Check that the value of this IE is set to the UARFN of cell 24 |
|   - Non freq related measurement event results | Cell measurement event results |
|   - CHOICE *mode* | TDD |
|   - Primary CCPCH info | |
|   - CHOICE *mode* | TDD |
|   - CHOICE *TDD option* | 1.28 Mcps TDD |
|   - TSTD indicator | FALSE |
|   - Cell parameters ID | Check to see if set to the same for cell 24 |
|   - SCTD indicator | FALSE |

MEASUREMENT REPORT (Step 12) (3.84Mcps TDD)

| Information Element | Value/Remark |
|---|---|
| Message Type | |
| Integrity check info | |
|   - Message authentication code | This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC Message sequence number | This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value. |
| Measurement identity | 2 |
| Measured Results | |
|   - Inter-frequency measured results list | |
|   - Frequency info | |
|   - CHOICE mode | TDD |
|    - UARFCN | Check that the value of this IE is set to the UARFN of cell 4 |
|   - UTRA carrier RSSI | Check that this IE is absent |
|   - Inter-frequency cell measurement results | Check that the value of this IE is set to 1 cell reported |
|   - Cell measured results | |
|   - Cell Identity | Check that this IE is absent |
|   - SFN-SFN observed time difference | Check that this IE is absent |
|   - Cell synchronisation information | Check that this IE is absent |
|   - CHOICE mode | TDD |
|   - Cell parameters Id | Check to see if it's the same for cell 4 |
|   - Proposed TGSN | Check that this IE is absent |
|   - Primary CCPCH Info | Check that this IE is present |
|   - PCCPCH RSCP | Check that this IE is present |
|   - Pathloss | Check that this IE is absent |
|   -Timeslot list | Check that this IE is absent |
| Measured results on RACH | Check that this IE is absent |
| Additional measured results | Check that this IE is absent |
| Event results | |
|   - Inter-frequency measurement event results | |
|   - Inter-frequency event identity | 2b |
|   - Inter-frequency cells | |
|   - Frequency info | |
|   - UARFCN | Check that the value of this IE is set to the UARFN of cell 4 |
|   - Non freq related measurement event results | |
|   - CHOICE *mode* | TDD |
|   - Primary CCPCH info | |
|   - CHOICE *mode* | TDD |
|   - CHOICE *TDD option* | 3.84 Mcps TDD |
|   - CHOICE SyncCase | Sync Case 2 |
|   - Timeslot | 0 |
|   - Cell parameters ID | Check to see if set to the same for cell 4 |
|   - SCTD indicator | FALSE |

MEASUREMENT REPORT (Step 12) (7.68Mcps TDD)

| Information Element | Value/Remark |
|---|---|
| Message Type | |
| Integrity check info | |
|   - Message authentication code | This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC Message sequence number | This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value. |
| Measurement identity | 2 |
| Measured Results | |
|   - Inter-frequency measured results list | |
|   - Frequency info | |
|    - CHOICE mode | TDD |
|     - UARFCN | Check that the value of this IE is set to the UARFN of cell 4 |
|   - UTRA carrier RSSI | Check that this IE is absent |
|   - Inter-frequency cell measurement results | Check that the value of this IE is set to 1 cell reported |
|    - Cell measured results | |
|    - Cell Identity | Check that this IE is absent |
|    - SFN-SFN observed time difference | Check that this IE is absent |
|    - Cell synchronisation information | Check that this IE is absent |
|    - CHOICE mode | TDD |
|    - Cell parameters Id | Check to see if it's the same for cell 4 |
|    - Proposed TGSN | Check that this IE is absent |
|    - Primary CCPCH Info | Check that this IE is present |
|     - PCCPCH RSCP | Check that this IE is present |
|    - Pathloss | Check that this IE is absent |
|    - Timeslot list | Check that this IE is absent |
| Measured results on RACH | Check that this IE is absent |
| Additional measured results | Check that this IE is absent |
| Event results | |
|   - Inter-frequency measurement event results | |
|    - Inter-frequency event identity | 2b |
|    - Inter-frequency cells | |
|     - Frequency info | |
|     - UARFCN | Check that the value of this IE is set to the UARFN of cell 4 |
|    - Non freq related measurement event results | |
|     - CHOICE *mode* | TDD |
|     - Primary CCPCH info | |
|      - CHOICE *mode* | TDD |
|      - CHOICE *TDD option* | 7.68 Mcps TDD |
|      - CHOICE SyncCase | Sync Case 2 |
|      - Timeslot | 0 |
|     - Cell parameters ID | Check to see if set to the same for cell 4 |
|     - SCTD indicator | FALSE |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 14)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

8.5.1.4.5　　　　Test requirement

After step 3, if compression is required, the UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

After step 11, the UE shall transmit a MEASUREMENT REPORT message with cell 24 as the reported cell.After step 13, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

### 8.5.1.4m MBMS PTM Session Start at MCCH Notification in CELL_DCH state / MBMS Multicast Service

#### 8.5.1.4m.1 Definition

This test is applicable for all UEs that support MBMS multicast services and support MBMS p-t-m reception in CELL_DCH state.

#### 8.5.1.4m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.4.2

#### 8.5.1.4m.3 Test purpose

Same test purpose as in clause 8.5.1.4.3.

#### 8.5.1.4m.4 Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 24.

User Equipment:

The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

- UE supports MBMS p-t-m reception in CELL_DCH state   Yes/No

Test procedure

Same test procedure as in clause 8.5.1.4.4.

Specific message contents

Same specific messages contents as in clause 8.5.1.4.4

#### 8.5.1.4m.5 Test requirements

Same test requirement as in clause 8.5.1.4.5.

### 8.5.1.5 MBMS PTM Session Start at MCCH Acquisition in CELL_DCH (for a non-MBMS service) when entering into an MBMS cell (UE capable of MBMS p-t-m reception in CELL_DCH) / MBMS Broadcast Service

#### 8.5.1.5.1 Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services and support MBMS p-t-m reception in CELL_DCH state.

#### 8.5.1.5.2 Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of

the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

Reference

3GPP TS 25.331 clauses 8.7.2.3, 8.7.3.3.1, 8.6.9.6.

### 8.5.1.5.3    Test purpose

1. To verify that the UE receives the MBMS information on MCCH in CELL_DCH state.

2. To verify that the UE, when entering into an MBMS cell in CELL_DCH state, starts the p-t-m reception of MBMS services according to the information on MCCH.

### 8.5.1.5.4    Method of test

Initial Condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 24.

User Equipment:

The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

- UE supports MBMS p-t-m reception in CELL_DCH state    Yes/No

Test Procedure

**Table 8.5.1.5**

| Parameter | Unit | Cell 21 | | Cell 24 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -70 | -70 | -60 |

Table 8.5.1.5 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution.

The UE is in the CELL_DCH state in cell 21 and has selected the broadcast service or joined the multicast service to be provided by the SS. The SS has configured its downlink transmission power setting according to columns "T0" in table 8.5.1.5.

The SS then configures its downlink transmission power setting according to columns "T1" in table 8.5.1.5 and transmits a PHYSICAL CHANNEL RECONFIGURATION message to the UE ordering the UE to change to Cell 24 on frequency Ch 2. At the activation time the UE changes to Cell 24 and transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message using AM RLC.

The SS waits for the UE to start reception of the MBMS data on MTCH and then the MBMS radio bearer on MTCH is put into loopback mode 3.

The SS sends 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.3 to check that UE is in CELL_DCH state.

> NOTE: If the UE fails the test because of a failure to reselect to a right cell, then the operator may re-run the test.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|----|---------|---------|
| | UE | SS | | |
| 1 | | ← | ACTIVATE RB TEST MODE | |
| 2 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | | | | The SS changes the power of the cells according to column T1 in table 8.5.1.5. |
| 4 | | ← | PHYSICAL CHANNEL RECONFIGURATION | The SS instructs the UE to change to Cell 24. |
| 5 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | |
| 6 | | SS | | The SS waits for the UE to activate MTCH reception in cell 24. |
| 7 | | ← | CLOSE UE TEST LOOP | |
| 8 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 9 | | SS | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 10 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 11 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data. |
| 12 | | ← | OPEN UE TEST LOOP | |
| 13 | → | | OPEN UE TEST LOOP COMPLETE | |
| 14 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific Message Contents

PHYSICAL CHANNEL RECONFIGURATION (Step 4) (FDD)

Use the same message as specified for "Packet to CELL_DCH from CELL_DCH in PS" in 34.108 except for the following:

| Information Element | Value/remark | Version |
|---|---|---|
| Frequency info | Set to the frequency of cell 24 | |
| Downlink information per radio link list | 1 radio link | |
|   Downlink information for each radio link | | |
|     - CHOICE mode | FDD | |
|       - Primary CPICH info | Set to the scrambling code for cell 24 | |

PHYSICAL CHANNEL RECONFIGURATION (Step 4) (3.84Mcps, 1.28Mcps and 7.68Mcps TDD)

Use the same message as specified for "Packet to CELL_DCH from CELL_DCH in PS" in 34.108 except for the following:

| Information Element | Value/remark | Version |
|---|---|---|
| Frequency info | Set to the frequency of cell 24 | |
| Downlink information per radio link list | 1 radio link | |
|   - Downlink information for each radio link | | |
|     - CHOICE mode | TDD | |
|       - Primary CCPCH info | Set to same code as used for cell 24 | |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 11)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

8.5.1.5.5 Test requirement

After step 4, the UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message in cell 24.

After step 10, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

## 8.5.1.5m MBMS PTM Session Start at MCCH Acquisition in CELL_DCH (for a non-MBMS service) when entering into an MBMS cell (UE capable of MBMS p-t-m reception in CELL_DCH) / MBMS Multicast Service

8.5.1.5m.1 Definition

This test is applicable for all UEs that support MBMS multicast services and support MBMS p-t-m reception in CELL_DCH state.

8.5.1.5m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.5.2

8.5.1.5m.3 Test purpose

Same test purpose as in clause 8.5.1.5.3.

8.5.1.5m.4 Method of test

Initial condition

System Simulator:

    2 MBMS cells, Cell 21 and Cell 24.

User Equipment:

The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE     Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.5.4.

Specific message contents

Same specific messages contents as in clause 8.5.1.5.4

8.5.1.5m.5        Test requirements

Same test requirement as in clause 8.5.1.5.5.

# 8.5.1.6        Void

# 8.5.1.6m        Void

# 8.5.1.7        Void

# 8.5.1.7m        Void

# 8.5.1.8        Void

# 8.5.1.9        MBMS PTM Session Start at MCCH Notification in Idle Mode / MBMS Broadcast Service

## 8.5.1.9.1        Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services.

## 8.5.1.9.2        Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

The UE may:

1> monitor the MBMS notification Indicator Channel (MICH);

1> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

2> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

2> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if not monitoring MICH:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5.

Reference

3GPP TS 25.331 clause 8.7.2.3, 8.7.3.3.1, 8.6.9.6.

### 8.5.1.9.3 Test purpose

1. To verify that the UE receives the MBMS information on MCCH in Idle Mode.

2. To verify that the UE correctly handles the notification procedure after receiving the MBMS MODIFIED SERVICES INFORMATION message via MCCH if no ongoing MBMS p-t-m session (MICH supported/not supported by the UE).

3. To verify that the UE starts the reception of MBMS services according to notification via MICH/MCCH when the UE is in Idle Mode.

### 8.5.1.9.4 Method of test

Initial Condition

System Simulator:

- 1 MBMS cell.

User Equipment:

- The UE is in Idle mode as specified in clause 7.6 of TS 34.108.

- The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

Test Procedure

UE is moved to CELL_DCH for RB Test Mode to be activated and then the RRC Connection is released to move UE back to Idle Mode.

The SS notifies on MICH and MCCH about the start of an MBMS session. The SS waits for the UE to start reception of the MBMS data on MTCH.

UE is moved to CELL_DCH for the UE Test Loop Mode 3 to be closed and then the RRC Connection is released to move UE back to Idle Mode.

The SS sends 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer.

UE is moved to CELL_DCH then retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

The UE Test Loop is opened and RB Test Mode in the UE is deactivated.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|------|---------|---------|
| | UE | SS | | |
| 1 | | ← | PAGING TYPE1 | Paging (PS domain, P-TMSI) |
| 2 | → | | RRC CONNECTION REQUEST | |
| 3 | | ← | RRC CONNECTION SETUP | |
| 4 | → | | RRC CONNECTION SETUP COMPLETE | |
| 5 | → | | SERVICE REQUEST | |
| 6 | | ← | AUTHENTICATION AND CIPHERING REQUEST | |
| 7 | → | | AUTHENTICATION AND CIPHERING RESPONSE | |
| 8 | | ← | SECURITY MODE COMMAND | |
| 9 | → | | SECURITY MODE COMPLETE | |
| 10 | | ← | ACTIVATE RB TEST MODE | |
| 11 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 12 | | ← | RRC CONNECTION RELEASE | |
| 13 | → | | RRC CONNECTION RELEASE COMPLETE | |
| 14 | | ← | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH according to MBMS p-t-m activation time set to the first TTI of the next modification period. |
| 15 | | ← | PAGING TYPE1 (PCCH) | Paging (PS domain, P-TMSI) |
| 16 | → | | RRC CONNECTION REQUEST | |
| 17 | | ← | RRC CONNECTION SETUP | |
| 18 | → | | RRC CONNECTION SETUP COMPLETE | |
| 19 | → | | SERVICE REQUEST | |
| 20 | | ← | AUTHENTICATION AND CIPHERING REQUEST | |
| 21 | → | | AUTHENTICATION AND CIPHERING RESPONSE | |
| 22 | | ← | SECURITY MODE COMMAND | |
| 23 | → | | SECURITY MODE COMPLETE | |
| 24 | | ← | CLOSE UE TEST LOOP | |
| 25 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 26 | | ← | RRC CONNECTION RELEASE | |
| 27 | → | | RRC CONNECTION RELEASE COMPLETE | |
| 28 | SS | | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 29 | | ← | PAGING TYPE1 | Paging (PS domain, P-TMSI) |
| 30 | → | | RRC CONNECTION REQUEST | |
| 31 | | ← | RRC CONNECTION SETUP | |
| 32 | → | | RRC CONNECTION SETUP COMPLETE | |
| 33 | → | | SERVICE REQUEST | |
| 34 | | ← | AUTHENTICATION AND CIPHERING REQUEST | |
| 35 | → | | AUTHENTICATION AND CIPHERING RESPONSE | |
| 36 | | ← | SECURITY MODE COMMAND | |
| 37 | → | | SECURITY MODE COMPLETE | |
| 38 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 39 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data. |
| 40 | | ← | OPEN UE TEST LOOP | |
| 41 | → | | OPEN UE TEST LOOP COMPLETE | |
| 42 | | ← | DEACTIVATE RB TEST MODE | |
| 43 | → | | DEACTIVATE RB TEST MODE COMPLETE | |

Specific Message Contents

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 39)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

#### 8.5.1.9.5 Test requirement

After step 38, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

## 8.5.1.9m MBMS PTM Session Start at MCCH Notification in Idle Mode / MBMS Multicast Service

#### 8.5.1.9m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.1.9m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.9.2

#### 8.5.1.9m.3 Test purpose

Same test purpose as in clause 8.5.1.9.3.

#### 8.5.1.9m.4 Method of test

Initial Condition

System Simulator:

- 1 MBMS cell.

User Equipment:

- The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

- The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE       Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.9.4.

Specific message contents

Same specific messages contents as in clause 8.5.1.9.4

#### 8.5.1.9m.5 Test requirements

Same test requirement as in clause 8.5.1.9.5.

## 8.5.1.10 Void

## 8.5.1.11 MBMS PTP Session Start at MCCH Notification in Idle Mode / MBMS Selected Service

#### 8.5.1.11.1 Definition

This test is applicable for all UEs that support MBMS broadcast services.

### 8.5.1.11.2 Conformance requirement

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

2> if the UE is in idle mode:

3> indicate to upper layers that establishment of a PS signalling connection is required to receive the concerned MBMS [5], unless the UE has already requested p-t-p RB establishment in the current modification period, and use the establishment cause set to 'MBMS ptp RB request' in the RRC connection establishment procedure.

…

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

1> set the IE "Establishment cause" to the value of the variable ESTABLISHMENT_CAUSE;

1> set the IE "Initial UE identity" to the value of the variable INITIAL_UE_IDENTITY;

1> set the IE "Protocol error indicator" to the value of the variable PROTOCOL_ERROR_INDICATOR; and

1> include the IE "Predefined configuration status information" and set this IE to true if the UE has all pre-configurations stored with the same value tag as broadcast in the cell in which the RRC connection establishment is initiated.

1> if the UE is attempting to establish the signalling connection to PS-domain:

2> include the IE "Domain Indicator" and set it to "PS domain".

1> else if the UE is attempting to establish the signalling connection to CS domain:

2> include the IE "Domain Indicator" and set it to "CS domain".

1> if the UE only supports HS-DSCH but not E-DCH:

2> include the IE "UE capability indication" and set it to the "HS-DSCH" value.

1> if the UE supports HS-DSCH and E-DCH:

2> include the IE "UE capability indication" and set it to the "HS-DSCH+E-DCH" value.

1> if the UE performs connection establishment for MBMS ptp radio bearer request as specified in subclause 8.6.9.6; and

1> if one or more of the MBMS services for which the UE initiates the ptp radio bearer request concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the ptp radio bearer request:

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> otherwise if the UE performs connection establishment for MBMS counting as specified in subclause 8.7.4; and

1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> if the UE included one or more "MBMS Selected Service ID" IEs:

    2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

The UE shall not include the IE "UE Specific Behaviour Information 1 idle".

…

If the IE "MBMS short transmission ID" is included the UE shall:

1> if the value of the "MBMS short transmission ID" is less than or equal to the number of services identified by the IE "Modified services list" included in the MBMS MODIFIED SERVICES INFORMATION message acquired in the same modification period as the one in which the "MBMS short transmission ID" is received:

    2> consider the "MBMS short transmission ID" to be an index to the list of services contained in the IE "Modified services list" and apply the MBMS transmission identity specified for this entry.

1> otherwise:

    2> compile a list of available MBMS services, as included in the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages acquired in the same modification period as the one in which the "MBMS short transmission ID" is received:

        3> concatenate the services contained in IE "Modified services list" included in the MBMS MODIFIED SERVICES INFORMATION and the services contained in IE "Unmodified services list" included in the MBMS UNMODIFIED SERVICES INFORMATION.

    2> consider the "MBMS short transmission ID" to be the index of the entry in the list of available services and apply the MBMS transmission identity specified for this entry.

…

The UE shall calculate the identity of a Modification period as follows:

$$MP\ identity = (SFN_{MP}\ div\ MP_{len})\ mod\ 2$$

With   $SFN_{MP}$ being the SFN corresponding with the frame in which the concerned Modification Period starts

$MP_{len}$ being the length of the Modification Period, that is indicated by the IE "Modification period coefficient" that is included in System Information Block type 5 and 5bis.

Reference

3GPP TS 25.331 clauses 8.6.9.6, 8.1.3.3, 8.6.9.8, 8.5.29.

### 8.5.1.11.3 Test purpose

To verify that the UE receives the MBMS info in idle mode state and correctly triggers the P-t-p request procedure.

### 8.5.1.11.4 Method of test

Initial condition

System Simulator:

    1 MBMS cell

User Equipment:

    The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

    The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-   MBMS Broadcast service application available on UE   Yes/No.

Test procedure

1)  The UE camping on Cell 21, receives an MBMS MODIFIED SERVICES INFORMATION messages including IEs "MBMS required UE action" set to "Request PTP RB".

2)  The UE shall request a p-t-p RB establishment. The UE transmits a RRC CONNECTION REQUEST message including the IE "MBMS Selected Service ID" of the concerned MBMS selected services within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

3)  The SS transmits a RADIO BEARER SETUP message to the UE. This message requests the establishment of a radio access bearer. The UE shall establish this radio bearer. Then the UE transmits a RADIO BEARER SETUP COMPLETE message using AM RLC.

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 2 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 3 | ← | | RRC CONNECTION SETUP | RRC state indicator set to Cell_DCH |
| 4 | → | | RRC CONNECTION SETUP COMPLETE | |
| 5 | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 5 and before step 11. |
| 6 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 7 | ← | | SECURITY MODE COMMAND | |
| 8 | → | | SECURITY MODE COMPLETE | |
| 9 | ← | | RADIO BEARER SETUP | |
| 10 | → | | RADIO BEARER SETUP COMPLETE | |
| 11 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Request PTP RB |
| - Continue MCCH reading | FALSE |

RRC CONNECTION REQUEST (Step 2)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI. |
| Establishment Cause | MBMS ptp RB request |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | |
| MBMS Selected Services | Only 1 entry |
| - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RRC CONNECTION SETUP (Step 3)

| Information Element | Value/remark |
|---|---|
| Message type | |
| RRC State Indicator | Cell_DCH |

MBMS MODIFICATION REQUEST (steps 5)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
| - MBMS Selected Services Full | |
| - MBMS Selected Service ID | Only 1 entry |
| - MBMS Service ID | MBMS service ID of the activated MBMS service |
| - CHOICE PLMN identity | Check to see that one of the below choice element is present |
| - SameAs-MIB | (no data) |
| - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

RADIO BEARER SETUP (Step 9)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9 with the condition B1.

#### 8.5.1.11.1.5 Test requirements

At step 2, the UE shall transmit a RRC CONNECTION REQUEST message with Establishment cause set to "MBMS ptp RB request". The UE shall include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

## 8.5.1.11m    MBMS PTP Session Start at MCCH Notification in Idle Mode / MBMS Multicast Service

#### 8.5.1.11m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.1.11m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.11.2 except there is no reference to 3GPP TS 25.331 clause 8.1.3.3..

Reference

3GPP TS 25.331 clauses 8.6.9.6, 8.6.9.8, 8.5.29.

8.5.1.11m.3 Test purpose

Same test purpose as in clause 8.5.1.11.3.

8.5.1.11m.4 Method of test

Initial condition

System Simulator:

1 MBMS cell

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.11.4 except for the point 2:

2) The UE shall request a p-t-p RB establishment. The UE transmits a RRC CONNECTION REQUEST message.

Expected sequence

Same expected sequence as in clause 8.5.5.11.4 except for RRC CONNECTION REQUEST message content (step 2) and MODIFICATION REQUEST procedure not required.

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | **UE** | **SS** | | |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 2 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request" |
| 3 | | ← | RRC CONNECTION SETUP | RRC state indicator set to Cell_DCH |
| 4 | → | | RRC CONNECTION SETUP COMPLETE | |
| 5 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Multicast service Reception". |
| 6 | | ← | SECURITY MODE COMMAND | |
| 7 | → | | SECURITY MODE COMPLETE | |
| 8 | | ← | RADIO BEARER SETUP | |
| 9 | → | | RADIO BEARER SETUP COMPLETE | |
| 10 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.1.11.4 except for RRC CONNECTION REQUEST message content (step 2)

RRC CONNECTION REQUEST (Step 2)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI. |
| Establishment Cause | MBMS ptp RB request |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | Not Present |

### 8.5.1.11m.5 Test requirements

At step 2, the UE shall transmit a RRC CONNECTION REQUEST message with Establishment cause set to "MBMS ptp RB request".

## 8.5.1.12 MBMS PTP Session Start at MCCH Notification in URA_PCH / MBMS Selected Service

### 8.5.1.12.1 Definition

This test is applicable for all UEs that support MBMS broadcast services.

### 8.5.1.12.2 Conformance requirement

The MBMS notification procedure is used by the UE to respond to a notification provided by UTRAN, indicating a change applicable for one or more MBMS services the UE has joined. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle and connected mode: URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH). The actual notification mechanism to be used depends on the UE state.

…

The UE shall:

   1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

      2> if not monitoring MICH:

         3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

         3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

….

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

   1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

      …

      2> if the UE is in URA_PCH, Cell_PCH or CELL_FACH states:

         3> indicate to upper layers to initiate a service request procedure [5] to receive the concerned MBMS service;

         3> perform the cell update procedure with cause "MBMS ptp RB request", as specified in subclause 8.3.1.2, unless the UE has already requested p-t-p RB establishment in the current modification period.

…

A UE shall initiate the cell update procedure in the following cases:

....

1> MBMS ptp RB request:

    2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and

    2> if the UE is in URA_PCH, Cell_PCH or Cell_FACH state; and

    2> if the UE should perform cell update for MBMS ptp radio bearer request as specified in 8.6.9.6:

        3> perform cell update using the cause "MBMS ptp RB request".

…

The UE shall set the IEs in the CELL UPDATE message as follows:

    …

1> if the UE performs cell update for MBMS ptp radio bearer request as specified in subclause 8.6.9.6; and

1> if one or more of the MBMS services for which the UE initiates the ptp radio bearer request concerns an MBMS Selected Service:

    2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates ptp radio bearer request:

        3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

        3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> otherwise, if the UE performs cell update for MBMS counting as specified in subclause 8.7.4; and

1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

    2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

        3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

        3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> if the UE included one or more "MBMS Selected Service ID" IEs:

    2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

…

If the IE "MBMS short transmission ID" is included the UE shall:

1> if the value of the "MBMS short transmission ID" is less than or equal to the number of services identified by the IE "Modified services list" included in the MBMS MODIFIED SERVICES INFORMATION message acquired in the same modification period as the one in which the "MBMS short transmission ID" is received:

    2> consider the "MBMS short transmission ID" to be an index to the list of services contained in the IE "Modified services list" and apply the MBMS transmission identity specified for this entry.

1> otherwise:

    2> compile a list of available MBMS services, as included in the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages acquired in the same modification period as the one in which the "MBMS short transmission ID" is received:

> > > 3> concatenate the services contained in IE "Modified services list" included in the MBMS MODIFIED SERVICES INFORMATION and the services contained in IE "Unmodified services list" included in the MBMS UNMODIFIED SERVICES INFORMATION.

> > 2> consider the "MBMS short transmission ID" to be the index of the entry in the list of available services and apply the MBMS transmission identity specified for this entry.

…

The UE shall calculate the identity of a Modification period as follows:

> $MP\ identity = (SFN_{MP}\ div\ MP_{len})\ mod\ 2$

> With   $SFN_{MP}$ being the SFN corresponding with the frame in which the concerned Modification Period starts

> $MP_{len}$ being the length of the Modification Period, that is indicated by the IE "Modification period coefficient" that is included in System Information Block type 5 and 5bis.

Reference

3GPP TS 25.331 clauses 8.7.3.1, 8.7.3.3.1, 8.6.9.6, 8.3.1.2, 8.3.1.3, 8.6.9.8, 8.5.29.

### 8.5.1.12.3          Test purpose

To verify that the UE receives the MBMS info in URA_PCH state and correctly triggers the P-t-p request procedure.

### 8.5.1.12.4          Method of test

Initial condition

System Simulator:

> 1 MBMS cell.

User Equipment:

> The UE is in URA_PCH state as specified in clause 7.6 of TS 34.108

> The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-   MBMS Broadcast service application available on UE    Yes/No.

Test procedure

1)  The UE is in URA_PCH state, shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION including the IE "MBMS required UE action" set to "Request PTP RB".

2)  The UE shall perform a cell update procedure with cause "MBMS ptp RB request". In case of MBMS Selected service, the UE transmits a CELL UPDATE message including the IE "MBMS Selected Service ID" of the concerned MBMS Selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

Expected sequence

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB". |
| 1a | | | | The UE enters the CELL_FACH state(Test procedure 2 and 3 only). |
| 2 | → | | CELL UPDATE | UE performs cell update procedure. The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS ptp RB request" |
| 3 | ← | | CELL UPDATE CONFIRM | RRC State Indicator is set to CELL_FACH |
| 3a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |
| 4 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 5 | SS | | | SS transmits the SERVICE ACCEPT message to the UE. |
| 6 | ← | | RADIO BEARER SETUP | RRC State Indicator is set to CELL_DCH |
| 7 | → | | RADIO BEARER SETUP COMPLETE | |
| 7a | → | | MBMS MODIFICATION REQUEST | This message may be received at any point after step 6 and before step 8. |
| 8 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | request PTP RB |

CELL UPDATE (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| Cell update cause | MBMS ptp RB request |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

CELL UPDATE CONFIRM (Step 3)

| Information Element | Value/remark |
|---------------------|--------------|
| New C-RNTI | '1010 1010 1010 1010' |

RADIO BEARER SETUP (Step 6)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9 with the condition B4.

MBMS MODIFICATION REQUEST (step 7a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info<br> - CHOICE Status<br>  - MBMS Selected Services Full<br>   - MBMS Selected Service ID<br>    - MBMS Service ID<br>    - CHOICE PLMN identity<br><br>     - SameAs-MIB<br>     - explicitPLMN_Id | <br>Some<br><br><br>MBMS service ID of the activated MBMS service<br>Check to see that one of the below choice element is present<br>(no data)<br>Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

#### 8.5.1.12.5 Test requirements

At step 2, the UE shall initiate a cell update procedure for MBMS ptp radio bearer request. The UE shall include in the transmitted CELL_UPDATE message the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity" in case of MBMS Selected service.

## 8.5.1.12m MBMS PTP Session Start at MCCH Notification in URA_PCH / MBMS Multicast Service

#### 8.5.1.12m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.1.12m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.12.2.

#### 8.5.1.12m.3 Test purpose

Same test purpose as in clause 8.5.1.12.3.

#### 8.5.1.12m.4 Method of test

Initial condition

System Simulator:

1 MBMS cell

User Equipment:

   The UE is in URA_PCH state as specified in clause 7.6 of TS 34.108

   The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-   MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.12.4, except that at step 4 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.1.12.4 except for CELL UPDATE (Step 2) and Service Request (Step 4)

CELL UPDATE (Step 2)

| Information Element | Value/remark |
|---|---|
| Cell update cause | MBMS ptp RB request |
| MBMS Selected Services | Not present |

### 8.5.1.12m.5 Test requirements

At step 2, the UE shall initiate a cell update procedure for MBMS ptp radio bearer request .

## 8.5.1.13 MBMS PTP Session Start at MCCH Notification in CELL_FACH / MBMS Selected Service

### 8.5.1.13.1 Definition

This test is applicable for all UEs that support MBMS broadcast services.

### 8.5.1.13.2 Conformance requirement

The MBMS notification procedure is used by the UE to respond to a notification provided by UTRAN, indicating a change applicable for one or more MBMS services the UE has joined. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle and connected mode: URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH). The actual notification mechanism to be used depends on the UE state.

…

The UE shall:

　1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

　　2> if not monitoring MICH:

　　　3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

　　　3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

….

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

　1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

　　…

　　2> if the UE is in URA_PCH, Cell_PCH or CELL_FACH states:

　　　3> indicate to upper layers to initiate a service request procedure [5] to receive the concerned MBMS service;

　　　3> perform the cell update procedure with cause "MBMS ptp RB request", as specified in subclause 8.3.1.2, unless the UE has already requested p-t-p RB establishment in the current modification period.

…

A UE shall initiate the cell update procedure in the following cases:

....

　1> MBMS ptp RB request:

　　2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and

    2> if the UE is in URA_PCH, Cell_PCH or Cell_FACH state; and

    2> if the UE should perform cell update for MBMS ptp radio bearer request as specified in 8.6.9.6:

       3> perform cell update using the cause "MBMS ptp RB request".

…

The UE shall set the IEs in the CELL UPDATE message as follows:

  …

  1> if the UE performs cell update for MBMS ptp radio bearer request as specified in subclause 8.6.9.6; and

  1> if one or more of the MBMS services for which the UE initiates the ptp radio bearer request concerns an MBMS Selected Service:

    2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates ptp radio bearer request:

       3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

       3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

  1> otherwise, if the UE performs cell update for MBMS counting as specified in subclause 8.7.4; and

  1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

    2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

       3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

       3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

  1> if the UE included one or more "MBMS Selected Service ID" IEs:

    2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

…

If the IE "MBMS short transmission ID" is included the UE shall:

  1> if the value of the "MBMS short transmission ID" is less than or equal to the number of services identified by the IE "Modified services list" included in the MBMS MODIFIED SERVICES INFORMATION message acquired in the same modification period as the one in which the "MBMS short transmission ID" is received:

    2> consider the "MBMS short transmission ID" to be an index to the list of services contained in the IE "Modified services list" and apply the MBMS transmission identity specified for this entry.

  1> otherwise:

    2> compile a list of available MBMS services, as included in the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages acquired in the same modification period as the one in which the "MBMS short transmission ID" is received:

       3> concatenate the services contained in IE "Modified services list" included in the MBMS MODIFIED SERVICES INFORMATION and the services contained in IE "Unmodified services list" included in the MBMS UNMODIFIED SERVICES INFORMATION.

2> consider the "MBMS short transmission ID" to be the index of the entry in the list of available services and apply the MBMS transmission identity specified for this entry.

…

The UE shall calculate the identity of a Modification period as follows:

$$MP\ identity = (SFN_{MP}\ div\ MP_{len})\ mod\ 2$$

With $SFN_{MP}$ being the SFN corresponding with the frame in which the concerned Modification Period starts

$MP_{len}$ being the length of the Modification Period, that is indicated by the IE "Modification period coefficient" that is included in System Information Block type 5 and 5bis.

Reference

3GPP TS 25.331 clauses 8.7.3.1, 8.7.3.3.1, 8.6.9.6, 8.3.1.2, 8.3.1.3, 8.6.9.8, 8.5.29.

### 8.5.1.13.3 Test purpose

To verify that the UE receives the MBMS info in Cell_FACH state and correctly triggers the P-t-p request procedure.

### 8.5.1.13.4 Method of test

Initial condition

System Simulator:

1 MBMS cell.

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No.

Test procedure

1) The UE is in Cell_FACH state, shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION including the IE "MBMS required UE action" set to "Request PTP RB".

2) The UE shall perform a cell update procedure with cause "MBMS ptp RB request". In case of MBMS Selected service, the UE transmits a CELL UPDATE message including the IE "MBMS Selected Service ID" of the concerned MBMS Selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB". |
| 2 | → | | CELL UPDATE | UE performs cell update procedure. The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS ptp RB request" |
| 3 | ← | | CELL UPDATE CONFIRM | RRC State Indicator is set to CELL_FACH |
| 4 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 5 | SS | | | SS transmits the SERVICE ACCEPT message to the UE. |
| 6 | ← | | RADIO BEARER SETUP | RRC State Indicator is set to CELL_DCH |
| 7 | → | | RADIO BEARER SETUP COMPLETE | |
| 7a | → | | MBMS MODIFICATION REQUEST | This message may be received at any point after step 6 and before step 8. |
| 8 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | request PTP RB |

CELL UPDATE (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| Cell update cause | MBMS ptp RB request |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RADIO BEARER SETUP (Step 6)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9 with the condition B4.

MBMS MODIFICATION REQUEST (step 7a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info<br> - CHOICE Status<br>  - MBMS Selected Services Full<br>    - MBMS Selected Service ID<br>      - MBMS Service ID<br>      - CHOICE PLMN identity<br><br>        - SameAs-MIB<br>        - explicitPLMN_Id | <br>Some<br><br><br><br>MBMS service ID of the activated MBMS service<br>Check to see that one of the below choice element is present<br>(no data)<br>Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

#### 8.5.1.13.5 Test requirements

At step 2, the UE shall initiate a cell update procedure for MBMS ptp radio bearer request. The UE shall include in the transmitted CELL_UPDATE message the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity" in case of MBMS Selected service.

## 8.5.1.13m MBMS PTP Session Start at MCCH Notification in CELL_FACH / MBMS Multicast Service

#### 8.5.1.13m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.1.13m.2 Conformance requirement

Same conformance requirement as in clause 8.5.1.13.2.

#### 8.5.1.13m.3 Test purpose

Same test purpose as in clause 8.5.1.13.3.

#### 8.5.1.13m.4 Method of test

Initial condition

System Simulator:

1 MBMS cell

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE     Yes/No.

Test procedure

Same test procedure as in clause 8.5.1.13.4, except that at step 4 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.1.13.4 except for CELL UPDATE (Step 2) and Service request(step 4)

CELL UPDATE (Step 2)

| Information Element | Value/remark |
|---|---|
| Cell update cause | MBMS ptp RB request |
| MBMS Selected Services | Not present |

### 8.5.1.13m.5        Test requirements

At step 2, the UE shall initiate a cell update procedure for MBMS ptp radio bearer request.

## 8.5.1.14        MBMS PTM Session Start at MCCH Acquisition / MBSFN mode

### 8.5.1.14.1        Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.1.14.2        Conformance requirement

The UE applies the MCCH acquisition procedure to determine the MBMS services available in the cell and to initiate reception of the services that the UE has activated. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle, URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH).

For 1.28 Mcps TDD, if the cell is operating in MBSFN mode, the MCCH will be deployed on the MBSFN Special Timeslot [30].

…

If the variable MBMS_ACTIVATED_SERVICES is not empty, the UE shall apply the MCCH acquisition procedure upon selecting (e.g. upon power on) or re-selecting a cell supporting MBMS or an MBSFN cluster, upon change of MBMS controlling cell (e.g. due to an active set update or hard handover), upon entering UTRA from another RAT, upon release of a MBMS PTP RB for the purpose of changing transfer mode, upon return from loss of coverage and upon receiving an indication from upper layers that the set of activated services has changed.

…

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

...

For cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3 the UE shall immediately acquire the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise for cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

When requested to acquire MBMS control information other than the MBMS ACCESS INFORMATION message, the UE shall:

> 1> if requested to start reading MCCH at the next modification period:

>> 2> start reading MCCH at the beginning of the next modification period.

> 1> otherwise

>> 2> start reading MCCH at the beginning of the next repetition period.

1> if requested to stop reading MCCH at the end of the modification period:

   2> continue reading MCCH until the required MBMS control information is received or until the UE detects a
   TTI in which no MCCH information is transmitted, whichever is first;

   2> continue reading MCCH in this manner at every subsequent repetition period, until the information is
   received correctly or until the end of the modification period.

1> otherwise:

   2> continue reading MCCH until the required MBMS control information is received or until the UE detects a
   TTI in which no MCCH information is transmitted, whichever is first;

   2> continue reading MCCH in this manner at every subsequent repetition period, until the information is
   received correctly.

   NOTE 1:  The UE may combine information received at different repetition periods within a modification period.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not
receiving a p-t-m RB for the concerned service:

   2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M
   RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages
   without delaying reading of MCCH until the next modification period and without stopping at the end of the
   modification period, in accordance with subclause 8.7.1.3

   2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB
   INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if
   received, in accordance with subclause 8.7.5;

…

Upon completing the reception of the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT
CELL P-T-M RB INFORMATION messages for an activated MBMS service, the UE shall:

1> if the UE is already receiving an MTCH and does not have the capability to receive the new service in addition:

   2> the UE behaviour is undefined.

   NOTE:     In this case, the UE may request upper layers to prioritise the services and only receive the service(s)
             prioritised by upper layers.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the
following;

1> if the UE previously received the service by means of a p-t-m radio bearer from a cell belonging to another
MBMS cell group:

   2> re-establish RLC;

   2> re-initialise PDCP.

1> start immediately to use the indicated configuration unless specified otherwise;

1> start or continue receiving the indicated p-t-m radio bearers depending on its UE capabilities.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information i.e. the
MBMS MODIFIED SERVICES INFORMATION message, MBMS UNMODIFIED SERVICES INFORMATION

message, MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION message should be acquired in the same modification period.

…

The UE shall:

1> if the IE "Secondary CCPCH system information MBMS" is included:

2> apply the Secondary CCPCH and FACH indicated by the IE "FACH carrying MCCH" for receiving MCCH.

1> otherwise, if the IE "Secondary CCPCH system information" includes the IE "MCCH configuration information":

2> apply the Secondary CCPCH and FACH indicated by the IE "MCCH configuration information" for receiving MCCH.

1> for TDD, if the IE "TDD MBSFN Information" is included:

2> apply the scrambling codes (as referenced by the "Cell parameters ID") to each timeslot indicated by "TDD MBSFN Information".

…

The UE shall select the Secondary CCPCH for acquiring MCCH information according to the following rules:

1> if System Information Block type 5 or System Information Block type 5bis is defined and includes an S-CCPCH within the IE "Secondary CCPCH system information" including a FACH for which the IE "MCCH configuration information" is included:

2> select that S-CCPCH and FACH for receiving MCCH.

1> otherwise if System Information Block type 5 or System Information Block type 5bis is defined and includes an SCCPCH within the IE "Secondary CCPCH system information MBMS" for which the IE "FACH carrying MCCH" is included:

2> select that S-CCPCH and FACH for receiving MCCH.

Reference

3GPP TS 25.331 clauses 8.7.2.1, 8.7.2.2, 8.7.2.3, 8.7.1.3, 8.6.9.6, 8.7.5.3, 8.1.1.6.5, 8.5.19a.

### 8.5.1.14.3 Test purpose

1. To verify that the UE acquires the MBMS information on MCCH after selecting the MBSFN cluster.

2. To verify that the UE, after acquiring the MBMS information on MCCH, starts the p-t-m reception of MBMS services according to the information on MCCH.

### 8.5.1.14.4 Method of test

Initial condition

System Simulator:

- MBSFN carrier: 2 cells, Cell 31 (PLMN1) and Cell 33 (PLMN1). Cell 33 is powered off. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default1 MCCH scheduling (No ongoing session) according to subclause 11.2 of TS 34.108.

- Unicast carrier : 1 cell, Cell 1 with default parameters.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with no services activated as specified in clause 7.6.3 of TS 34.108.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

- Support of transmit and receive functions available on UE   Yes/No.

- Support of MBSFN receive only function available on UE   Yes/No.

Test procedure

**Table 8.5.1.14**

| Parameter | Unit | Cell 1 | | Cell 31 | | Cell 33 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Ch. 1 | | Ch. 2 | | Ch. 3 | |
| CPICH Ec (FDD) | dBm / 3.84MHz | -60 | -60 | -60 | OFF | OFF | -60 |
| P-CCPCH RSCP (TDD) | dBM | -60 | -60 | -60 | OFF | OFF | -60 |

Table 8.5.1.14 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution.

a) The UE is camping on Cell 1 and Cell 31. SS requests the UE to activate a local service for which there will be a session ongoing on MBSFN Cell 33 (see TS 34.108 clause 11.2.4) when the UE selects that MBSFN cell.

b) The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE.

c) The SS then sends CLOSE UE TEST LOOP to activate RLC SDU counting on the MTCH of Cell 33 (Transmission identity corresponding to the activated local service).

d) The SS switches off Cell 31 and powers on Cell 33.

e) The UE camps on Cell 33 on the MBSFN carrier. The SS transmits the SYSTEM INFORMATION BLOCK TYPE 5 message indicating the configuration of the S-CCPCH carrying MCCH within the IE " Secondary CCPCH system information MBMS". In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 33 using MBMS configuration C2 (one PTM session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD).

f) The UE shall perform the MCCH acquisition procedure. The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION, the MBMS UNMODIFIED SERVICES INFORMATION, the MBMS GENERAL INFORMATION, the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M INFORMATION.

g) The UE shall continue acquiring the above MBMS messages until it has received a consistent set of MCCH information in the same modification period. The UE shall start receiving the p-t-m radio bearer for the ongoing activated MBMS service indicated in the MBMS UNMODIFIED SERVICES INFORMATION message according to the configuration defined in the MBMS CURRENT CELL P-T-M INFORMATION (one ongoing session corresponding to the service activated at the UE. The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

h) The SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for the activated service.

i) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0.

Expected sequence

| Step | Direction | | Carrier | Message | Comment |
|---|---|---|---|---|---|
| | UE | SS | | | |
| 1 | | | | | SS requests the UE to activate a local service. |
| 2 | ← | | U | ACTIVATE RB TEST MODE | |
| 3 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 4 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated. Short Transmission Identity for the selected local service on Cell 33. |
| 5 | | SS | | | The SS powers off Cell 31 and powers on Cell 33. |
| 6 | ← | | M | SYSTEM INFORMATION BLOCK TYPE 5 | |
| 7 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. One ongoing service corresponding to that activated at the UE 129.6(FDD) or 124(TDD) kbps PS RAB |
| 8 | UE | | M | | The UE shall continue acquiring the above MBMS messages until it has received a consistent set of MCCH information in the same modification period. |
| 9 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer and close the test loop. |
| 10 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH. |
| 11 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 12 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 13 | ← | | U | OPEN UE TEST LOOP | |
| 14 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 15 | ← | | U | DEACTIVATE RB TEST MODE | |
| 16 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1 with the following exceptions:

There are no exceptions for this test case.

### 8.5.1.14.5 Test requirements

1) After step 12, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a number > 0 for Cell 33 MTCH.

## 8.5.1.15 MBMS PTM Session Start at MCCH Notification / MBSFN mode

### 8.5.1.15.1 Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.1.15.2 Conformance requirement

The UE applies the MCCH acquisition procedure to determine the MBMS services available in the cell and to initiate reception of the services that the UE has activated. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle, URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH).

For 1.28 Mcps TDD, if the cell is operating in MBSFN mode, the MCCH will be deployed on the MBSFN Special Timeslot [30].

…

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the

next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

...

For cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3 the UE shall immediately acquire the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise for cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

When requested to acquire MBMS control information other than the MBMS ACCESS INFORMATION message , the UE shall:

> 1> if requested to start reading MCCH at the next modification period:
>
>> 2> start reading MCCH at the beginning of the next modification period.
>
> 1> otherwise
>
>> 2> start reading MCCH at the beginning of the next repetition period.
>
> 1> if requested to stop reading MCCH at the end of the modification period:
>
>> 2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;
>
>> 2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly or until the end of the modification period.
>
> 1> otherwise:
>
>> 2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;
>
>> 2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly.
>
> NOTE 1:  The UE may combine information received at different repetition periods within a modification period.

…

The MBMS notification procedure is used by the UE to respond to a notification provided by UTRAN, indicating a change applicable for one or more MBMS services the UE has activated. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle and connected mode: URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH). The actual notification mechanism to be used depends on the UE state.

…

The UE may:

> 1> monitor the MBMS notification Indicator Channel (MICH);
>
> 1> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:
>
>> 2> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;
>
>> 2> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if not monitoring MICH during the current or the previous modification period:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info– PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

Upon completing the reception of the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION messages for an activated MBMS service, the UE shall:

1> if the UE is already receiving an MTCH and does not have the capability to receive the new service in addition:

2> the UE behaviour is undefined.

NOTE:     In this case, the UE may request upper layers to prioritise the services and only receive the service(s) prioritised by upper layers.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if the UE previously received the service by means of a p-t-m radio bearer from a cell belonging to another MBMS cell group:

2> re-establish RLC;

2> re-initialise PDCP.

1> start immediately to use the indicated configuration unless specified otherwise;

1> start or continue receiving the indicated p-t-m radio bearers depending on its UE capabilities.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information i.e. the MBMS MODIFIED SERVICES INFORMATION message, MBMS UNMODIFIED SERVICES INFORMATION message, MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION message should be acquired in the same modification period.

…

The UE shall:

1> if the IE "Secondary CCPCH system information MBMS" is included:

2> apply the Secondary CCPCH and FACH indicated by the IE "FACH carrying MCCH" for receiving MCCH.

1> otherwise, if the IE "Secondary CCPCH system information" includes the IE "MCCH configuration information":

2> apply the Secondary CCPCH and FACH indicated by the IE "MCCH configuration information" for receiving MCCH.

1> for TDD, if the IE "TDD MBSFN Information" is included:

2> apply the scrambling codes (as referenced by the "Cell parameters ID") to each timeslot indicated by "TDD MBSFN Information".

Reference

3GPP TS 25.331 clauses 8.7.2.1, 8.7.2.3, 8.7.1.3, 8.7.3.1, 8.7.3.3.1, 8.6.9.6, 8.7.5.3, 8.1.1.6.5

### 8.5.1.15.3 Test purpose

1. To verify that the UE receives updated MBMS information on MCCH of the MBSFN cluster.

2. To verify that the UE correctly handles the notification procedure after receiving the MBMS MODIFIED SERVICES INFORMATION message via MCCH if there is no ongoing MBMS p-t-m session (MICH supported/not supported by the UE).

3. To verify that the UE starts the reception of MBMS services according to notification via MICH/MCCH.

### 8.5.1.15.4 Method of test

Initial condition

System Simulator:

- MBSFN carrier: 1 cell, Cell 31 (PLMN1). In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default1 MCCH scheduling (No ongoing session) according to subclause 11.2 of TS 34.108.

- Unicast carrier : 1 cell, Cell 1 with default parameters.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with one activated service as specified in clause 7.6.4 of TS 34.108. The UE has selected (i.e. it is included in MBMS_ACTIVATED_SERVICES variable) a national service for which a session will start on MBSFN Cell 31 (see TS 34.108 clause 11.2.4) during the test.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE Yes/No.

- Support of transmit and receive functions available on UE Yes/No.

- Support of MBSFN receive only function available on UE Yes/No.

Test procedure

a) The UE is camping on Cell 1 and Cell 31. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 (no session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

b) The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE.

c) The SS sends CLOSE UE TEST LOOP to activate RLC SDU counting on Cell 31 MTCH (Transmission identity indicating the MBMS activated service).

d) The SS notifies on MCCH about the start of an MBMS session for one modification period. MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C4 (one PTM session starting) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

e) From the first SFN of the next modification period the SS transmits MCCH messages on Cell 31 using MBMS configuration C2 (one PTM session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108; and the SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for the activated service. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD).

f) The UE establishes the p-t-m radio bearer for the activated service according to the specified service activation time (i.e. the first SFN of the modification period following the notification (step d). The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

g) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0.

Expected sequence

| Step | Direction | | Carrier | Message | Comment |
|------|------|------|---------|---------|---------|
| | UE | SS | | | |
| 1 | ← | | U | ACTIVATE RB TEST MODE | |
| 2 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated on Cell 31 for the selected national service on MTCH. |
| 4 | ← | | M | MBMS MCCH Message Configuration C4 | Includes the national service activated at UE in the modified services list for one modification period. Activation time is the start of the next modification period. |
| 5 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. One ongoing service corresponding to that activated at the UE 129.6(FDD) or 124(TDD) kbps PS RAB |
| 6 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer and close the test loop. |
| 7 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH starting at the indicated activation time. |
| 8 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 9 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 10 | ← | | U | OPEN UE TEST LOOP | |
| 11 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 12 | ← | | U | DEACTIVATE RB TEST MODE | |
| 13 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1 with the following exceptions:

There are no exceptions for this test case.

### 8.5.1.15.5 Test requirements

1) After step 9, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a number > 0 for the identified MTCH RB on Cell 33.

## 8.5.2 MBMS Session Reconfiguration

### 8.5.2.1 MBMS PTP Session Reconfiguration – Change of Activated Service / MBMS Selected Service

#### 8.5.2.1.1 Definition

This test is applicable for all UEs that support MBMS broadcast services and MBMS service change for a ptp RB and capable of reading MCCH in CELL_DCH state.

#### 8.5.2.1.2 Conformance requirement

If the UE has included the IE "Support of MBMS service change for a ptp RB" in a previous MBMS MODIFICATION REQUEST message and if the IE "RAB information for MBMS ptp bearer" is included then the UE shall:

> 1> if an entry for the radio access bearer identified by the IE "RB Identity" already exists in the variable ESTABLISHED_RABS and a value of the IE "MBMS Service Identity" is stored in this entry of the variable ESTABLISHED_RABS:

>> 2> notify upper layers that the radio access bearer characterised by the parameters currently stored in this entry of the variable ESTABLISHED_RABS is released;

>> 2> reuse this entry of the variable ESTABLISHED_RABS and update it with the received value of IE "MBMS Service Identity" and, if included, with the received value of IE "MBMS Session Identity";

>> 2> notify upper layers that the radio access bearer characterised by the updated parameters in this entry is established.

> 1> else:

>> 2> set the variable INVALID_CONFIGURATION to TRUE.

…

The UE may:

> 1> if not receiving an MBMS service provided via a p-t-m radio bearer; or

> 1> if receiving an MBMS service provided via a p-t-m radio bearer that has scheduling information for that service on MSCH:

>> 2> monitor the MBMS notification Indicator Channel (MICH).

>> 2> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

>>> 3> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

>>> 3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

The UE shall:

…

> 1> if in CELL_DCH state:

2> if receiving an MBMS service that is provided via a p-t-m radio bearer:

    3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

    3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

    2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

    2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5

…

The UE shall set the contents of the MBMS MODIFICATION REQUEST message as follows:

    …

1> if there is a change in selection of one or more of the MBMS Selected Services:

    2> if the UE has not selected any MBMS Selected Service:

        3> include the IE "MBMS Selected Service Info" and set the Status to 'None'.

    2> otherwise:

        3> include the IE "MBMS Selected Service Info" and set the Status to 'Some';

        3> if the UE supports the actions specified upon reception of the IE "RAB information for MBMS ptp bearer":

            4> include the IE "Support of MBMS service change for a ptp RB";

        3> for each MBMS Selected Service:

            4> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Full" before those selected with a lower priority;

            4> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Full".

Reference

3GPP TS 25.331 clauses 8.6.4.2b, 8.7.3.3.1, 8.6.9.6, 8.7.6.2a.

### 8.5.2.1.3          Test purpose

To verify that the UE in Cell_DCH, stops the reception of an MBMS service and starts the reception of a new MBMS service.

### 8.5.2.1.4          Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 24

**User Equipment:**

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE has selected the broadcast service to be provided by the SS (MBMS Selected Services: Service_1 included in MBMS_ACTIVATED_SERVICES variable).

**Related ICS/IXIT statements**

- MBMS Broadcast service application available on UE    Yes/No

- UE supports MCCH reception in CELL_DCH state    Yes/No

- UE Supports MBMS service change for a ptp RB    Yes/No

**Test procedure**

1) The UE camping on cell 21, receives an MBMS UNMODIFIED SERVICES INFORMATION message including the IE "MBMS required UE action" set to "Request PTP RB".

2) The UE shall request a p-t-p RB establishment. The UE transmits a RRC CONNECTION REQUEST message including the IE "MBMS Selected Service ID" of the concerned MBMS selected services within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

3) Upon reception of the RADIO BEARER SETUP message, the UE shall establish this radio bearer. Then the UE transmits a RADIO BEARER SETUP COMPLETE message and starts receiving the MBMS service provided by the p-t-p RB. The variable ESTABLISHED_RABS contains the RB Identity and the MBMS Service Identity of MBMS Selected Service Service_1.

4) The UE selects the MBMS Service_2 and indicates there is a change in selection of the MBMS Selected Services by transmitting an MBMS MODIFICATION REQUEST message including the IE "Support of MBMS service change for a ptp RB" to indicate it supports the actions upon reception of IE "RAB information for MBMS ptp bearer".

5) The SS transmits a RADIO BEARER RECONFIGURATION including IE "RAB information for MBMS ptp bearer list " with RAB information for MBMS Selected Service Service_2:

   - The radio access bearer for MBMS Service_1 is released, the UE stops the reception of MBMS Service_1.

   - The ESTABLISHED_RABS is updated with the parameters for MBMS Selected Service Service_2. The radio access bearer for MBMS Selected Service Service_2 is established.

6) The UE shall transmit a RADIO BEARER RECONFIGURATION COMPLETE message on Cell 24.

**Expected Sequence**

| Step | Direction | | Message | Comments |
|------|-----------|------|---------|----------|
| | **UE** | **SS** | | |
| | | | | Service_1 is available in Cell 21 |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | |
| 2 | | ← | MBMS GENERAL INFORMATION | |
| 3 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 4 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 5 | | ← | RRC CONNECTION SETUP | RRC state indicator set to Cell_FACH |
| 6 | → | | RRC CONNECTION SETUP COMPLETE | |

| 6a | → | MBMS MODIFICATION REQUEST | The UE completing the RRC Connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 6 and before step 12. |
|---|---|---|---|
| 7 | UE | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 8 | ← | SECURITY MODE COMMAND | |
| 9 | → | SECURITY MODE COMPLETE | |
| 10 | ← | RADIO BEARER SETUP | |
| 11 | → | RADIO BEARER SETUP COMPLETE | |
| 12 | UE | | The UE is receiving the MBMS service provided by the p-t-p RB. RB Identity and MBMS Service Identity of MBMS Service_1 stored in ESTABLISHED_RABS |
| 13 | UE | | The UE selects the MBMS Service_2 and de-selects MBMS Service_1 ( via MMI command) |
| 14 | → | MBMS MODIFICATION REQUEST | The UE transmits the message with IE "Support of MBMS service change for a ptp RB" set to TRUE. |
| 15 | ← | RADIO BEARER RECONFIGURATION | IE "RAB information for MBMS ptp bearer list" with RAB information for MBMS Selected Service_2. |
| 16 | UE | | -RAB for MBMS Selected Service_1 is released. The UE stops receiving the MBMS service 1. -ESTABLISHED_RABS is updated with RB Identity and MBMS Service Identity of MBMS Service_2. -RAB for MBMS Selected Service_2 is established. The UE shall move to the Cell 24 where Service_2 is available |
| 17 | → | RADIO BEARER RECONFIGURATION COMPLETE | |
| 18 | UE | | The UE is receiving the MBMS Selected Service_2 provided by the p-t-p RB. |
| 19 | ←→ | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS UNMODIFIED SERVICES INFORMATION (Step 3)

| Information Element | Value/remark |
|---|---|
| Unmodified services list<br>- MBMS Transmission identity | Only 1 entry<br>MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Request PTP RB |

RRC CONNECTION REQUEST (Step 4)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI |
| Establishment Cause | MBMS ptp RB request |
| Domain indicator | PS domain |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RRC CONNECTION SETUP (Step 5)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Set to same value as received in Step 4 |
| RRC State Indicator | Cell_FACH |

MBMS MODIFICATION REQUEST (Step 6a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
|   - MBMS Selected Services Full | |
|     - MBMS Selected Service ID | Only 1 entry |
|       - MBMS Service ID | MBMS service ID of the activated MBMS service |
|       - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|         - SameAs-MIB | (no data) |
|         - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

RADIO BEARER SETUP (Step 10)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9, with the condition B2.

MBMS MODIFICATION REQUEST (Step 14)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| MBMS Selected Service Info | |
| MBMS RB list requested to be released | |
| - RB information to release | |
|   - RB identity | RB identity for MBMS service1 provided via ptp RB |
| MBMS Selected Service Info | |
|   - MBMS Selected Service ID | Only 1entry |
|     - MBMS Service ID | MBMS short transmission identity referring to the service the UE has selected Service_2 |
| Support of MBMS service change for a ptp RB | TRUE |

RADIO BEARER RECONFIGURATION (Step 15)

| Information Element | Value/remark |
|---|---|
| RB information elements | |
| - RAB information for MBMS ptp bearer list | Only 1 entry |
|     - RAB information for MBMS ptp bearer | |
|     - RB Identity | RBid_1 |
|     - MBMS Service Identity | Coded as octets 3 to 5 of the IE *Temporary Mobile Group Identity* for Service_2 |
|     - MBMS Session Identity | Session_id_2 |

### 8.5.2.1.5          Test requirements

At step 4, the UE shall transmit a RRC CONNECTION REQUEST message with Establishment cause set to "MBMS reception" and with the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

After step 6, the UE shall transmit a RADIO BEARER SETUP COMPLETE message.

At step 13, the UE shall request MBMS P-T-P Modification Request.

After step 15, upon reception of a RADIO BEARER RECONFIGURATION message, the radio access bearer for ptp transmission of MBMS Selected Service Service_1 is released and the radio access bearer used for ptp transmission of MBMS Selected Service Service_2 is established. The UE stops receiving the MBMS Selected Service Service_1 and moves to cell 24.

At step 17, the UE shall transmit a RADIO BEARER RECONFIGURATION COMPLETE message.

## 8.5.2.1m          MBMS PTM Session Reconfiguration - Change of Activated Service / MBSFN mode (FDD)

### 8.5.2.1m.1          Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.2.1m.2          Conformance requirement

The UE applies the MCCH acquisition procedure to determine the MBMS services available in the cell and to initiate reception of the services that the UE has activated. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle, URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH).

If the variable MBMS_ACTIVATED_SERVICES is not empty, the UE shall apply the MCCH acquisition procedure upon selecting (e.g. upon power on) or re-selecting a cell supporting MBMS or an MBSFN cluster, upon change of MBMS controlling cell (e.g. due to an active set update or hard handover), upon entering UTRA from another RAT, upon release of a MBMS PTP RB for the purpose of changing transfer mode, upon return from loss of coverage and upon receiving an indication from upper layers that the set of activated services has changed.

…

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

...

For cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3 the UE shall immediately acquire the MBMS GENERAL INFORMATION messages i.e. It shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise for cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. Both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

When requested to acquire MBMS control information other than the MBMS ACCESS INFORMATION message, the UE shall:

> 1> if requested to start reading MCCH at the next modification period:

>> 2> start reading MCCH at the beginning of the next modification period.

> 1> otherwise

>> 2> start reading MCCH at the beginning of the next repetition period.

> 1> if requested to stop reading MCCH at the end of the modification period:

>> 2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;

>> 2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly or until the end of the modification period.

> 1> otherwise:

>> 2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;

>> 2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly.

> NOTE 1: The UE may combine information received at different repetition periods within a modification period.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

> 1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

> 1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

>> 2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

>> 2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

Upon completing the reception of the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION messages for an activated MBMS service, the UE shall:

> 1> if the UE is already receiving an MTCH and does not have the capability to receive the new service in addition:

>> 2> the UE behaviour is undefined.

> NOTE: In this case, the UE may request upper layers to prioritise the services and only receive the service(s) prioritised by upper layers.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if the UE previously received the service by means of a p-t-m radio bearer from a cell belonging to another MBMS cell group:

2> re-establish RLC;

2> re-initialise PDCP.

1> start immediately to use the indicated configuration unless specified otherwise;

1> start or continue receiving the indicated p-t-m radio bearers depending on its UE capabilities.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information i.e. the MBMS MODIFIED SERVICES INFORMATION message, MBMS UNMODIFIED SERVICES INFORMATION message, MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION message should be acquired in the same modification period.

…

The UE shall:

1> if the IE "Secondary CCPCH system information MBMS" is included:

2> apply the Secondary CCPCH and FACH indicated by the IE "FACH carrying MCCH" for receiving MCCH.

1> otherwise, if the IE "Secondary CCPCH system information" includes the IE "MCCH configuration information":

2> apply the Secondary CCPCH and FACH indicated by the IE "MCCH configuration information" for receiving MCCH.

1> for TDD, if the IE "TDD MBSFN Information" is included:

2> apply the scrambling codes (as referenced by the "Cell parameters ID") to each timeslot indicated by "TDD MBSFN Information".

…

The UE shall select the Secondary CCPCH for acquiring MCCH information according to the following rules:

1> if System Information Block type 5 or System Information Block type 5bis is defined and includes an S-CCPCH within the IE "Secondary CCPCH system information" including a FACH for which the IE "MCCH configuration information" is included:

2> select that S-CCPCH and FACH for receiving MCCH.

1> otherwise if System Information Block type 5 or System Information Block type 5bis is defined and includes an SCCPCH within the IE "Secondary CCPCH system information MBMS" for which the IE "FACH carrying MCCH" is included:

2> select that S-CCPCH and FACH for receiving MCCH.

Reference

3GPP TS 25.331 clauses 8.7.2.1, 8.7.2.2, 8.7.2.3, 8.7.1.3, 8.6.9.6, 8.7.5.3, 8.1.1.6.5, 8.5.19a.

8.5.2.1m.3 Test purpose

To verify that on indication from upper layers that there has been a change to the activated service the UE stops the reception of the currently received MBMS service.

To verify that the UE starts the reception of the new MBMS service now available on the same MBSFN cluster.

8.5.2.1m.4 Method of test

Initial condition

System Simulator:

- MBSFN carrier: 1 cell, Cell 31.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with no services activated as specified in clause 7.6.3 of TS 34.108.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE  Yes/No.

- Support of transmit and receive functions available on UE   Yes/No.

- Support of MBSFN receive only function available on UE   Yes/No.

Test procedure

a) The UE is camping on cell 31, receives an MBMS UNMODIFIED SERVICES INFORMATION message including the IE "MBMS required UE action" set to "Acquire PTM RB".

b) The UE start reception of the MBMS data on MTCH.

c) A new session is setting up by up layer. The SS then notifies on the MCCH the change in services. The SS transmits an MBMS MODIFIED SERVICES INFORMATION including new IE "Service Identity " and "required UE action" Selected Service Service_2

d) The UE selects the MBMS Service_2.:

- The UE stops the reception of MBMS Service_1.

-  The ESTABLISHED_RABS is updated with the parameters for MBMS Selected Service Service_2. The UE establish to receive MBMS Service_2

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | **UE** | **SS** | | |
| | | | | Service_1 is available in Cell 31 |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | |
| 2 | | ← | MBMS COMMON P-T-M RB INFORMATION | |
| 3 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | "MBMS required UE action" set to 'Acquire PTM RB'. |
| 4 | UE | | | The UE establish to receive Service_1 |
| 5 | | ← | MBMS MODIFIED SERVICES INFORMATION | When a new session is set up the SS notifies on the MCCH the change in the MBMS service at another modification period. |
| 6 | | ← | MBMS COMMON P-T-M RB INFORMATION | |
| 7 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | Service_2 is available in Cell 31 |
| 8 | UE | | | The UE selects the MBMS Service_2 |
| 9 | UE | | | The UE stop to receive Service_1 |
| 10 | UE | | | The UE establish to receive Service_2 |
| 11 | | ← | CLOSE UE TEST LOOP | |
| 12 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 13 | | | | The SS broadcasts MBMS data 10 RLC SDUs of on MTCH on the concerned MBMS radio bearer. |

| 14 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | The SS checks that the UE has received MBMS data. |
| 15 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | |
| 16 | ← | OPEN UE TEST LOOP | |
| 17 | → | OPEN UE TEST LOOP COMPLETE | |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1 with the following exceptions:

MBMS UNMODIFIED SERVICES INFORMATION (Step 3)

| Information Element | Value/remark |
|---|---|
| Unmodified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Acquire PTM RB |

MBMS UNMODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark |
|---|---|
| - MBMS Service ID | 2 MBMS Service ID |
| MBMS required UE action | Acquire PTM RB |

8.5.2.1m.5            Test requirements

At step 4, the UE shall establish receive Service_1.

After step 5, a new session is set up by up layer

At step 10, the UE stops receive Service_1 and establish to receive Service_2

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. <br> SS: MCCH message combination C4 for 1 modification period, then combination C2 |
| 2 | ← | | MBMS COMMON P-T-M RB INFORMATION | UE begins reception of the MBMS service using the 256kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.7(FDD) or clause 6.11.5.4.4.7 (1.28 Mcps TDD). |
| 3 | ← | | CLOSE UE TEST LOOP | |
| 4 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 5 | SS | | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 6 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 7 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than zero and records the value. |
| 8 | ← | | MBMS MODIFIED SERVICES INFORMATION | SS indicates a change in the MBMS Broadcast Service for Service ID 1 with MBMS p-t-m activation time set to the first TTI of the next modification period. <br> SS: MCCH message combination C4 for 1 modification period, then combination C2 |
| 9 | | | MBMS COMMON P-T-M RB INFORMATION | UE begins reception of the MBMS service using the 128kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.6(FDD) or clause 6.11.5.4.4.6 (1.28 Mcps TDD). |
| 10 | | | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer, starting at MBMS p-t-m activation time. |
| 11 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 12 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than the reported value at step 9, |
| 13 | ← | | OPEN UE TEST LOOP | |
| 14 | → | | OPEN UE TEST LOOP COMPLETE | |

Specific Message Contents.

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Modified service list | |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |

MBMS MODIFIED SERVICES INFORMATION (Step 8)

| Information Element | Value/remark |
|---|---|
| Modified service list | |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |
| MBMS p-t-m activation time | Set to the first TTI of the next modification period. |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 7)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

### 8.5.1.15.5 Test requirements

At step 7 the UE shall send a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE with a RLC SDU counter value greater than zero.

At step 12 the UE shall send a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE with a RLC SDU counter value greater than the reported value at previous sub-test.

NOTE: For UE in UE test loop mode 3 then the RLC SDU counter value is only reset upon reception of CLOSE UE TEST LOOP message configuring UE test loop mode 3. As the test runs without deactivating the UE test mode then the SS needs to check the reported counter value against the value reported at previous check.

## 8.5.2.2 MBMS PTM Session Reconfiguration – Transfer Mode Change to PTP / MBMS Selected Service

### 8.5.2.2.1 Definition

This test is applicable for all UEs supporting MBMS broadcast services.

### 8.5.2.2.2 Conformance requirement

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if receiving an MBMS service that is provided via a p-t-m radio bearer; or

2> if not receiving an MBMS service that is provided via a p-t-m radio bearer and not monitoring MICH:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

1> if in CELL_DCH state:

2> if receiving an MBMS service that is provided via a p-t-m radio bearer:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

….

1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

2> if the UE is in idle mode:

3> indicate to upper layers that establishment of a PS signalling connection is required to receive the concerned MBMS service [5], unless the UE has already requested p-t-p RB establishment in the current modification period, and use the establishment cause set to 'MBMS ptp RB request' in the RRC connection establishment procedure.

2> if the UE is in URA_PCH, Cell_PCH, or CELL_FACH states:

3> indicate to upper layers to initiate a service request procedure [5] to receive the concerned MBMS service;

3> perform the cell update procedure with cause "MBMS ptp RB request", as specified in subclause 8.3.1.2, unless the UE has already requested p-t-p RB establishment in the current modification period.

1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

2> stop receiving the concerned MBMS service;

2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

2> if the UE does not decide to receive an MBMS service for which a preferred frequency applies; and

2> if the IE 'MBMS dispersion indicator' is set to TRUE; and

2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

4> select a suitable UTRA cell in that frequency.

4> if no suitable UTRA cell in that frequency is found:

5> select a suitable UTRA cell in another frequency.

3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

5> select a suitable UTRA cell in the selected frequency

5> if no suitable UTRA cell in the selected frequency is found:

6> select a suitable UTRA cell in another frequency.

3> clear the variable MBMS_PREV_FREQUENCY_INFO.

2> clear all service specific information applicable for the concerned service.

NOTE:    The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

…

1> if the UE performs cell update for MBMS ptp radio bearer request as specified in subclause 8.6.9.6; and

1> if one or more of the MBMS services for which the UE initiates the ptp radio bearer request concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates ptp radio bearer request:

3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

Reference

3GPP TS 25.331, clauses 8.7.3.3.1, 8.6.9.6, 8.3.1.3.

### 8.5.2.2.3 Test purpose

To verify UE correctly handles the transfer mode change from MBMS PTM RB to MBMS PTP RB.

### 8.5.2.2.4 Method of test

Initial condition

System Simulator:

1 MBMS cell, Cell 21

User Equipment:

The UE is in Cell_FACH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No

Test procedure

1) The UE in Cell_FACH state, receives an MBMS MODIFIED SERVICES INFORMATION messages including IEs "MBMS required UE action" set to "Acquire PTM RB info". The UE starts receiving the indicated p-t-m radio bearer.

2) The SS waits for the UE to start reception of the MBMS data on MTCH and then the MBMS radio bearer on MTCH is put into loopback mode 3.

3) The SS starts broadcasting MBMS data on MTCH on the new concerned MBMS radio bearer. The SS continues to transmit MBMS data for 5s and then the SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

4) The UE receives an MBMS MODIFIED SERVICES INFORMATION message including IE "MBMS required UE action" set to "Request PTP RB" for the same concerned MBMS.

5) The UE releases the MBMS PTM RB and shall request a p-t-p RB establishment. The UE shall perform a cell_update procedure with cause "MBMS ptp RB request".

6) The UE requests reception of the PTP service by transmitting a SERVICE REQUEST message.

7) The SS initiates establishment of a pt-p radio bearer by sending a RADIO BEARER SETUP message to the UE. The UE returns a RADIO BEARER SETUP COMPLETE to confirm that the p-t-p MBMS bearer is established.

8) SS calls for generic procedure C.3 to check that UE is in CELL_DCH state.

Expected Sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| | | | | The UE is in cell_FACH. |
| 0a | ← | | ACTIVATE RB TEST MODE | |
| 0b | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 2 | | | VOID | |
| 3 | | | VOID | |
| 4 | | | VOID | |
| 5 | → | | | The SS waits a few seconds for the UE to activate MTCH reception |
| 6 | ← | | CLOSE UE TEST LOOP | |
| 7 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 8 | ← | | | The SS broadcasts MBMS data 10 RLC SDUs of on MTCH on the concerned MBMS radio bearer. |
| 9 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | The SS checks that the UE has received MBMS data. |
| 10 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | |
| 11 | | SS | OPEN UE TEST LOOP | |
| 12 | ← | | OPEN UE TEST LOOP COMPLETE | |
| 13 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Request PTP RB". |
| 14 | → | | CELL UPDATE | The UE transmits the message with cell update cause set to "MBMS ptp RB request" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 15 | ← | | CELL UPDATE CONFIRM | RRC State Indicator is set to CELL-FACH |
| 16 | | UE | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 17 | | SS | | SS transmits the SERVICE ACCEPT message to the UE. |
| 18 | ← | | RADIO BEARER SETUP | RRC State Indicator set to CELL-DCH |
| 19 | → | | RADIO BEARER SETUP COMPLETE | |
| 20 | → | | MBMS MODIFICATION REQUEST | This message may be received at any point after step 18 and before step 21. |
| 21 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Acquire PTM RB info |

MBMS MODIFIED SERVICES INFORMATION (Step 13)

| Information Element | Value/remark |
|---|---|
| Modified service list<br>- MBMS Transmission identity<br><br>MBMS required UE action | Only 1 entry<br>MBMS Transmission identity indicating MBMS activated service<br> Request PTP RB |

CELL UPDATE (Step 14)

| Information Element | Value/remark |
|---|---|
| Cell update cause<br>MBMS Selected Services<br>- MBMS Selected Services<br>   - MBMS Selected Service ID<br><br>- Modification period identity | MBMS ptp RB request<br><br>Only 1 entry<br>MBMS short transmission identity referring to the service the UE has selected<br>Indicates the modification period the MBMS short transmission identities refer to |

RADIO BEARER SETUP (Step 18)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9, with the condition B4.

MBMS MODIFICATION REQUEST (STEP 20)

| Information Element | Value/remark |
|---|---|
| MBMS Selected Service Info<br>  - CHOICE Status<br>    - MBMS Selected Services Full<br>      - MBMS Selected Service ID<br>       - MBMS Service ID<br>       - CHOICE PLMN identity<br><br>      - SameAs-MIB<br>      - explicitPLMN_Id | <br>Some<br><br><br>MBMS service ID of the activated MBMS service<br> Check to see that one of the below choice element is present<br>(no data)<br>Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

#### 8.5.2.2.5 Test requirements

At step 11, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

At step 14, the UE shall send a CELL UPDATE message with Cell update cause set to "MBMS ptp RB request".

At step 19, the UE shall transmit RADIO BEARER SETUP COMPLETE message.

## 8.5.2.2m MBMS PTM Session Reconfiguration - Transfer Mode Change to PTP / MBMS Multicast Service

#### 8.5.2.2m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.2.2m.2 Conformance requirement

Same conformance requirement as in clause 8.5.2.2.2.

#### 8.5.2.2m.3 Test purpose

Same test purpose as in clause 8.5.2.2.3.

**8.5.2.2m.4** **Method of test**

Initial condition

System Simulator:

  1 MBMS cell, Cell 21.

User Equipment:

  The UE is in Cell_FACH as specified in clause 7.6 of TS 34.108.

  The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

  - MBMS Multicast service application available on UE     Yes/No.

Test procedure

Same test procedure as in clause 8.5.2.2.4.

Expected Sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| | | | | The UE is in cell_FACH. |
| 0a | ← | | ACTIVATE RB TEST MODE | |
| 0b | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 2 | ← | | MBMS GENERAL INFORMATION | |
| 3 | ← | | MBMS COMMON P-T-M RB INFORMATION | |
| 4 | ← | | MBMS CURRENT CELL P-T-M RB INFORMATION | |
| 5 | | | | The SS waits a few seconds for the UE to activate MTCH reception |
| 6 | ← | | CLOSE UE TEST LOOP | |
| 7 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 8 | ← | | | The SS broadcasts MBMS data 10 RLC SDUs of on MTCH on the concerned MBMS radio bearer. |
| 9 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | The SS checks that the UE has received MBMS data. |
| 10 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | |
| 11 | ← | | OPEN UE TEST LOOP | |
| 12 | → | | OPEN UE TEST LOOP COMPLETE | |
| 13 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Request PTP RB". |
| 14 | → | | CELL UPDATE | The UE transmits the message with cell update cause set to "MBMS ptp RB request" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 15 | ← | | CELL UPDATE CONFIRM | RRC State Indicator is set to CELL-FACH |
| 16 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Multicast service Reception". |
| 17 | | SS | | SS transmits the SERVICE ACCEPT message to the UE. |
| 18 | ← | | RADIO BEARER SETUP | RRC State Indicator set to CELL-DCH |

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 19 | → | | RADIO BEARER SETUP COMPLETE | |
| 20 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails |

Specific message contents

Same specific messages contents as in clause 8.5.2.2.4 except for CELL UPDATE message content (step 14).

CELL UPDATE (Step 14)

| Information Element | Value/remark |
|---|---|
| Cell update cause | MBMS ptp RB request |

#### 8.5.2.2m.5 Test requirements

Same test requirement as in clause 8.5.2.2.5.

### 8.5.2.3 MBMS PTP Session Reconfiguration - Transfer mode change to PTM / MBMS Selected Service

#### 8.5.2.3.1 Definition

This test is applicable for all UEs that support MBMS broadcast services and capable of reading MCCH in CELL_DCH state.

#### 8.5.2.3.2 Conformance requirement

If the variable MBMS_ACTIVATED_SERVICES is not empty, the UE shall apply the MCCH acquisition procedure upon selecting (e.g. upon power on) or re-selecting a cell supporting MBMS, upon change of MBMS controlling cell (e.g. due to an active set update or hard handover), upon entering UTRA from another RAT, upon release of a MBMS PTP RB for the purpose of changing transfer mode, upon return from loss of coverage and upon receiving an indication from upper layers that the set of activated services has changed.

…

A UE entering CELL_DCH shall initiate the MBMS modification request procedure in the following cases:

1> if the UE has any MBMS Selected Service; and

1> if the IE "MCCH configuration information" was received in System Information Block Type 5 or System Information Block Type 5bis prior to entering CELL_DCH.

A UE completing an RRC Connection Setup procedure shall initiate the MBMS modification request procedure in the following cases:

1> if the UE has any MBMS Selected Service; and

1> if the IE "MCCH configuration information" was received in System Information Block Type 5 or System Information Block Type 5bis prior to completing the RRC Connection Setup procedure.

A UE in CELL_DCH shall initiate the MBMS modification request procedure in the following cases:

1> the preferred frequency applicable for the MBMS service prioritised by upper layers is different from the currently used frequency;

1> upper layers request to discontinue reception of an MBMS service provided via a p-t-p radio bearer e.g. because this inhibits reception of a higher priority service;

1> upon a change in selection of the MBMS Selected Services.

NOTE: The above case may occur upon receiving a dedicated notification or in other cases e.g. a change of transfer mode from p-t-p to p-t-m for the UE's highest priority MBMS service.

…

If the IE "MBMS RB list released to change transfer mode" is included the UE shall:

1> perform the service prioritisation procedure as specified in subclause 8.5.26, taking into account that the MBMS service(s) for which the radio bearers are released will be provided via p-t-m radio bearer(s).

…

A UE in CELL_DCH shall initiate the MBMS modification request procedure in the following cases:

1> the preferred frequency applicable for the MBMS service prioritised by upper layers is different from the currently used frequency;

1> upper layers request to discontinue reception of an MBMS service provided via a p-t-p radio bearer e.g. because this inhibits reception of a higher priority service;

1> upon a change of the MBMS Selected Services.

NOTE: The above case may occur upon receiving a dedicated notification or in other cases e.g. a change of transfer mode from p-t-p to p-t-m for the UE's highest priority MBMS service.

…

1> if the IE "MBMS required UE action" is set to 'Request PTP RB':

2> if the UE is in idle mode:

3> indicate to upper layers that establishment of a PS signalling connection is required to receive the concerned MBMS service [5], unless the UE has already requested p-t-p RB establishment in the current modification period, and use the establishment cause set to 'MBMS ptp RB request' in the RRC connection establishment procedure.

…

If the IE "MBMS RB list released to change transfer mode" is included the UE shall:

1> perform the service prioritisation procedure as specified in subclause 8.5.26, taking into account that the MBMS service(s) for which the radio bearers are released will be provided via p-t-m radio bearer(s).

Reference

3GPP TS 25.331 clauses 8.7.2.2, 8.7.6.2, 8.6.9.5, 8.6.9.6, 8.6.9.5.

### 8.5.2.3.3 Test purpose

To verify that the UE shall apply the MCCH acquisition procedure upon release of a MBMS PTP RB for the purpose of changing transfer mode.

### 8.5.2.3.4 Method of test

Initial condition

System Simulator: 1 MBMS cell, Cell 21.

User Equipment:

The UE has a valid IMSI.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No

- UE supports MCCH reception in CELL_DCH        Yes/No

Test procedure

1) The UE camping on cell A, receives an MBMS MODIFIED SERVICES INFORMATION message including IE "MBMS required UE action" set to "Request PTP RB".

2) The UE shall request a p-t-p RB establishment. The UE transmits a RRC CONNECTION REQUEST message including the IE "MBMS Selected Service ID" of the concerned MBMS selected services within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

3) Upon reception of the RADIO BEARER SETUP message, the UE shall establish this radio bearer. Then the UE transmits a RADIO BEARER SETUP COMPLETE message and start receiving the MBMS service provided by the p-t-p RB.

4) Upon reception of the RADIO BEARER RELEASE message including the IE "MBMS RB list released to change transfer mode", the UE shall release the MBMS p-t-p radio bearer for the purpose of changing transfer mode.

5) The UE shall apply the MCCH acquisition procedure. The UE receives a MBMS UNMODIFIED SERVICES INFORMATION message with "MBMS required UE action" IE set to "Acquire PTM RB info". The UE start receiving the indicated p-t-m radio bearer.

6) The SS waits for the UE to start reception of the MBMS data on MTCH and then the MBMS radio bearer on MTCH is put into loopback mode 3.

7) The SS starts broadcasting MBMS data on MTCH on the new concerned MBMS radio bearer. The SS continues to transmit MBMS data for 5s and then the SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

8) The loopback mode 3 in the UE is deactivated and SS calls for generic procedure C.3 to check that UE is in CELL_DCH state.

Expected Sequence

| Step | Direction | | Message | Comments |
|------|----|----|---------|----------|
| | **UE** | **SS** | | |
| | | | | UE in Idle mode on Cell 21. |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 2 | | | void | |
| 3 | | | void | |
| 4 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 5 | ← | | RRC CONNECTION SETUP | RRC state indicator set to Cell_FACH |
| 6 | → | | RRC CONNECTION SETUP COMPLETE | |
| 6a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC Connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 6 and before step 12 |
| 7 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 8 | ← | | SECURITY MODE COMMAND | |

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 9 | → | | SECURITY MODE COMPLETE | |
| 10 | ← | | RADIO BEARER SETUP | |
| 11 | → | | RADIO BEARER SETUP COMPLETE | |
| 12 | UE | | | The UE is receiving the MBMS service provided by the p-t-p RB. |
| 13 | ← | | RADIO BEARER RELEASE | IE "RAB information for MBMS ptp bearer list " with RAB information for MBMS Selected Service_1 |
| 14 | → | | RADIO BEARER RELEASE COMPLETE | the UE releases the MBMS p-t-p radio bearer for the purpose of changing transfer mode. |
| 15 | ← | | ACTIVATE RB TEST MODE | The SS activates the RB TEST MODE |
| 16 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 17 | SS | | | The following messages are sent on the next MP. |
| 18 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 19 | | | void | |
| 20 | | | void | |
| 21 | | | void | |
| 22 | | | void | |
| 23 | SS | | | The SS waits a few seconds for the UE to activate MTCH reception |
| 24 | ← | | CLOSE UE TEST LOOP | |
| 25 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 26 | | | | The SS broadcasts MBMS data 10 RLC SDUs of on MTCH on the concerned MBMS radio bearer. |
| 27 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | The SS checks that the UE has received MBMS data. |
| 28 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | |
| 29 | ← | | OPEN UE TEST LOOP | |
| 30 | → | | OPEN UE TEST LOOP COMPLETE | |
| 31 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|--------------------|--------------|
| Modified services list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity |
| - MBMS required UE action | Request PTP RB |

RRC CONNECTION REQUEST (Step 4)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI |
| Establishment Cause | MBMS ptp RB request |
| Domain indicator | PS domain |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RRC CONNECTION SETUP (Step 5)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Set to same value as received in Step 4 |
| RRC State Indicator | Cell_FACH |

MBMS MODIFICATION REQUEST (steps 6a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
|   - MBMS Selected Services Full | |
|    - MBMS Selected Service ID | Only 1 entry |
|     - MBMS Service ID | MBMS service ID of the activated MBMS service |
|     - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|      - SameAs-MIB | (no data) |
|      - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

RADIO BEARER SETUP (Step 10)

Use the same message as the one specified for "MBMS PtP" in TS 34.108 clause 9, with the condition B2.

RADIO BEARER RELEASE (Step 13)

| Information Element | Value/remark |
|---|---|
| MBMS RB list released to change transfer mode | Only 1 entry |
| - RB information to release | |
|   - RB identity | RB identity for MBMS service1 provided via ptp RB |

MBMS MODIFIED SERVICES INFORMATION (Step 18)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |

8.5.2.3.5 Test requirements

At step 6, the UE shall send a RRC CONNECTION SETUP COMPLETE message.

At step 11, the UE shall send a RADIO BEARER SETUP COMPLETE message.

At step 14, the UE shall send a RADIO BEARER RELEASE COMPLETE message.

At step 28, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

## 8.5.2.3m MBMS PTP Session Reconfiguration - Transfer mode change to PTM / MBMS Multicast Service

### 8.5.2.3m.1 Definition

This test is applicable for all UEs that support MBMS multicast services and capable of reading MCCH in CELL_DCH state.

### 8.5.2.3m.2 Conformance requirement

Same conformance requirement as in clause 8.5.2.3.2

### 8.5.2.3m.3 Test purpose

Same test purpose as in clause 8.5.2.3.3.

### 8.5.2.3m.4 Method of test

Initial condition

System Simulator:

    1 MBMS cell

User Equipment:

    The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

    The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-   MBMS Multicast service application available on UE          Yes/No.

-   UE supports MCCH reception in CELL_DCH     Yes/No

Test procedure

Same test procedure as in clause 8.5.2.2.4 except for the point 2:

2)  The UE shall request a p-t-p RB establishment. The UE transmits a RRC CONNECTION REQUEST message.

Expected Sequence

Same expected sequence as in clause 8.5.2.3.4 except for RRC CONNECTION REQUEST message content (step 4) and MODIFICATION REQUEST procedure not required.

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| | | | | UE in Idle mode on Cell 21. |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | |
| 2 | | ← | MBMS GENERAL INFORMATION | |
| 3 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | "MBMS required UE action" set to Request PTP RB. |
| 4 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS ptp RB request" |
| 5 | | ← | RRC CONNECTION SETUP | RRC state indicator set to Cell_FACH |
| 6 | → | | RRC CONNECTION SETUP COMPLETE | |

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 7 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Multicast service Reception". |
| 8 | ← | | SECURITY MODE COMMAND | |
| 9 | → | | SECURITY MODE COMPLETE | |
| 10 | ← | | RADIO BEARER SETUP | |
| 11 | → | | RADIO BEARER SETUP COMPLETE | |
| 12 | UE | | | The UE is receiving the MBMS service provided by the p-t-p RB. |
| 13 | ← | | RADIO BEARER RELEASE | IE "RAB information for MBMS ptp bearer list " with RAB information for MBMS Service_1 |
| 14 | → | | RADIO BEARER RELEASE COMPLETE | the UE releases the MBMS p-t-p radio bearer for the purpose of changing transfer mode. |
| 15 | ← | | ACTIVATE RB TEST MODE | The SS activates the RB TEST MODE |
| 16 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 17 | SS | | | The following messages are sent on the next MP. |
| 18 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 19 | ← | | MBMS UNMODIFIED SERVICES INFORMATION | |
| 20 | ← | | MBMS GENERAL INFORMATION | |
| 21 | ← | | MBMS COMMON P-T-M RB INFORMATION | |
| 22 | ← | | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | |
| 23 | SS | | | The SS waits a few seconds for the UE to activate MTCH reception |
| 24 | ← | | CLOSE UE TEST LOOP | |
| 25 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 26 | | | | The SS broadcasts MBMS data 10 RLC SDUs of on MTCH on the concerned MBMS radio bearer. |
| 27 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | The SS checks that the UE has received MBMS data. |
| 28 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | |
| 29 | ← | | OPEN UE TEST LOOP | |
| 30 | → | | OPEN UE TEST LOOP COMPLETE | |
| 31 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.2.3.4 except for RRC CONNECTION REQUEST message content (step 4).

RRC CONNECTION REQUEST (Step 4)

| Information Element | Value/remark |
|---------------------|--------------|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI |
| Establishment Cause | MBMS ptp RB request |
| Domain indicator | PS domain |

8.5.2.3m.5 Test requirements

Same test requirement as in clause 8.5.2.3.5.

### 8.5.2.4      MBMS PTM Session Reconfiguration – MTCH data rate change / MBMS Broadcast Service

#### 8.5.2.4.1                Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services.

#### 8.5.2.4.2                Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

The UE may:

 1> monitor the MBMS notification Indicator Channel (MICH);

 1> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

  2> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

  2> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

The UE shall:

 1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

  2> if not monitoring MICH:

   3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

   3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

 1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

 1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

  2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

  2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received,  in accordance with subclause 8.7.5.

Reference

3GPP TS 25.331 clauses 8.7.2.3, 8.7.3.3.1, 8.6.9.6.

### 8.5.2.4.3 Test purpose

To verify that the UE shall receive the MBMS notification information while receiving an ongoing MBMS service via a p-t-m radio bearer, and apply the new p-t-m radio bearer configuration.

### 8.5.2.4.4 Method of test

Initial Condition

System Simulator:

    1 MBMS cell.

User Equipment:

    The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

    The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statement(s)

  - MBMS Broadcast service application available on UE    Yes/No

Test Procedure

The UE is in the CELL_FACH state and has selected the broadcast service or joined the multicast service to be provided by the SS..

The SS notifies on MICH and MCCH about the start of an MBMS session. The SS waits for the UE to start reception of the MBMS data on MTCH.

The MBMS radio bearer on MTCH is put into loopback mode 3.

The SS sends 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer, then retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number of received RLC SDUs reported by the UE shall be at least one.

The SS then notifies on the MCCH the change in the MBMS session . The UE reconfigures the radio bearer to new configuration. The SS sends 10 RLC SDUs of MBMS data on the MTCH on the concerned MBMS radio bearer, then retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The number reported by the UE shall be one more than the value reported at the previous check.

The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.2 to check that UE is in CELL_FACH state.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | ← | | ACTIVATE RB TEST MODE | |
| 2 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | ← | | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. SS: MCCH message combination C4 for 1 modification period, then combination C2 |
| 4 | ← | | MBMS COMMON P-T-M RB INFORMATION | UE begins reception of the MBMS service using the 259.2kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.7(FDD) or clause 6.11.5.4.4.7 (1.28 Mcps TDD). |
| 5 | ← | | CLOSE UE TEST LOOP | |
| 6 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 7 | SS | | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 8 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 9 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than zero and records the value. |
| 10 | ← | | MBMS MODIFIED SERVICES INFORMATION | SS indicates a change in the MBMS Broadcast Service for Service ID 1 with MBMS p-t-m activation time set to the first TTI of the next modification period. SS: MCCH message combination C4 for 1 modification period, then combination C2 |
| 11 | | | MBMS COMMON P-T-M RB INFORMATION | UE begins reception of the MBMS service using the 129.6kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.6(FDD) or clause 6.11.5.4.4.6 (1.28 Mcps TDD). |
| 12 | | | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer, starting at MBMS p-t-m activation time. |
| 13 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 14 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than the reported value at step 9, |
| 15 | ← | | OPEN UE TEST LOOP | |
| 16 | → | | OPEN UE TEST LOOP COMPLETE | |
| 17 | ←→ | | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific Message Contents

MBMS MODIFIED SERVICES INFORMATION (Step 3)

| Information Element | Value/remark |
|---|---|
| Modified service list<br> - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |

MBMS MODIFIED SERVICES INFORMATION (Step 10)

| Information Element | Value/remark |
|---|---|
| Modified service list<br> - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |
| MBMS p-t-m activation time | Set to the first TTI of the next modification period. |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 9)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

8.5.2.4.5 Test requirement

At step 9 the UE shall send a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE with a RLC SDU counter value greater than zero.

At step 14 the UE shall send a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE with a RLC SDU counter value greater than the reported value at previous sub-test.

Note For UE in UE test loop mode 3 then the RLC SDU counter value is only reset upon reception of CLOSE UE TEST LOOP message configuring UE test loop mode 3. As the test runs without deactivating the UE test mode then the SS needs to check the reported counter value against the value reported at previous check.

## 8.5.2.4m MBMS PTM Session Reconfiguration – MTCH data rate change / MBMS Multicast Service

8.5.2.4m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

8.5.2.4m.2 Conformance requirement

Same conformance requirement as in clause 8.52.4.2

8.5.2.4m.3 Test purpose

Same test purpose as in clause 8.5.2.4.3

8.5.2.4m.4 Method of test

Initial condition

System Simulator:

1 MBMS cell

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.2.4.4

Specific message contents

Same specific messages contents as in clause 8.5.2.4.4

#### 8.5.2.4m.5 Test requirements

Same test requirement as in clause 8.5.2.4.5

## 8.5.2.5 MBMS PTM Session Reconfiguration - MTCH Data Rate Change / MBSFN mode

### 8.5.2.5.1 Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.2.5.2 Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

...

For cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3 the UE shall immediately acquire the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise for cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

The UE may:

1> monitor the MBMS notification Indicator Channel (MICH);

1> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

2> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

2> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if not monitoring MICH during the current or the previous modification period:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info– PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

Upon completing the reception of the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION messages for an activated MBMS service, the UE shall:

1> if the UE is already receiving an MTCH and does not have the capability to receive the new service in addition:

2> the UE behaviour is undefined.

NOTE:     In this case, the UE may request upper layers to prioritise the services and only receive the service(s) prioritised by upper layers.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if the UE previously received the service by means of a p-t-m radio bearer from a cell belonging to another MBMS cell group:

2> re-establish RLC;

2> re-initialise PDCP.

1> start immediately to use the indicated configuration unless specified otherwise;

1> start or continue receiving the indicated p-t-m radio bearers depending on its UE capabilities.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information i.e. the MBMS MODIFIED SERVICES INFORMATION message, MBMS UNMODIFIED SERVICES INFORMATION message, MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION message should be acquired in the same modification period.

Reference

3GPP TS 25.331 clauses 8.7.2.3, 8.7.3.3.1, 8.6.9.6, 8.7.5.3

8.5.2.5.3              Test purpose

To verify that the UE receives the MBMS notification information while receiving an ongoing MBMS service via a p-t-m radio bearer, and applies the new p-t-m radio bearer configuration.

8.5.2.5.4                    Method of test

Initial condition

System Simulator:

- MBSFN carrier: 1 cell, Cell 31 (PLMN1). In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default1 MCCH scheduling (No ongoing session) according to subclause 11.2 of TS 34.108.

- Unicast carrier : 1 cell, Cell 1 with default parameters.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with one activated service as specified in clause 7.6.4 of TS 34.108. The UE has selected (i.e. it is included in MBMS_ACTIVATED_SERVICES variable) a national service for which a session will start on MBSFN Cell 31 (see TS 34.108 clause 11.2.4) during the test.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

- Support of transmit and receive functions available on UE    Yes/No.

- Support of MBSFN receive only function available on UE    Yes/No.

Test procedure

a) The UE is camping on Cell 1 and Cell 31. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 (no session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

b) The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE.

c) The SS sends CLOSE UE TEST LOOP to activate RLC SDU counting on Cell 31 MTCH (Transmission identity indicating the MBMS activated service).

d) The SS notifies on MCCH about the start of an MBMS session for one modification period. MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C4 (one PTM session starting) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

e) MCCH messages are then transmitted by the SS on Cell 31 using MBMS configuration C2 (one PTM session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

f) The UE establishes the p-t-m radio bearer for the activated service according to the specified service activation time (i.e. the first SFN of the modification period following the notification (step d). The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

g) The SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for the activated service. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD).

h) The SS shall then send UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST. The UE shall respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0. The SS shall store the counter value.

i)  The SS notifies on MCCH about the modification of the MBMS session for one modification period. MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C4 (service modification indicated) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

j)  MCCH messages are then transmitted by the SS on Cell 31 using MBMS configuration C2 (one PTM session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

k)  The UE reconfigures the p-t-m radio bearer for the activated service according to the received MBMS COMMON P-T-M RB INFORMATION at the specified service activation time (i.e. the first SFN of the modification period following the notification (step i).

l)  The SS broadcasts 10 RLC SDUs on the modified MTCH configured on the MBMS p-t-m radio bearer for the activated service. The service is carried on a 259.2 kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.7(FDD) or a 497.6 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.11 (3.84 Mcps TDD) or clause 6.11.5.4.4.11 (1.28 Mcps TDD) or clause 6.11.6.4.4.11 (7.68 Mcps TDD).

m)  The SS shall then send UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST. The UE shall respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE corresponds to > 0 received RLC SDUs

Expected sequence

| Step | Direction UE | Direction SS | Carrier | Message | Comment |
|------|------|------|---------|---------|---------|
| 1 | ← | | U | ACTIVATE RB TEST MODE | |
| 2 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated on Cell 31 for the selected national service on MTCH. |
| 4 | ← | | M | MBMS MCCH Message Configuration C4 | Includes the national service activated at UE in the modified services list for one modification period. |
| 5 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. One ongoing service corresponding to that activated at the UE 129.6(FDD) or 124(TDD) kbps PS RAB |
| 6 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer and close the test loop. |
| 7 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH starting at the indicated activation time. |
| 8 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 9 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs received on the MTCH is greater than zero. SS stores value. |
| 10 | ← | | M | MBMS MCCH Message Configuration C4 | Includes the ongoing national service in the modified services list for one modification period. New data rate is 259.2 (FDD) or 496(TDD) kbps. |
| 11 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. One ongoing service corresponding to that activated at the UE. |
| 12 | | SS | M | | The SS waits for the UE to reconfigure reception of the modified MTCH according to the activation time. Then the SS transmits 10 RLC SDUs on the MTCH. |
| 13 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 14 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 15 | ← | | U | OPEN UE TEST LOOP | |
| 16 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 17 | ← | | U | DEACTIVATE RB TEST MODE | |
| 18 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1 with the following exceptions:

There are no exceptions for this test case.

8.5.2.5.5 Test requirements

1) After step 9, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a number > 0 for the service/session activated on the Cell 33 MTCH.

1) After step 14, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a number > 0 for the service/session activated on the Cell 33 MTCH.

## 8.5.3 MBMS Frequency Layer Convergence and Dispersion

### 8.5.3.1 MBMS Session Start (Frequency Layer Convergence)/Session Stop (Frequency Layer Dispersion) in Idle mode / MBMS Selected Service

#### 8.5.3.1.1 Definition

This test is applicable for all UEs supporting MBMS broadcast services.

#### 8.5.3.1.2 Conformance requirement

The UE shall perform the MBMS frequency layer selection procedure upon receiving the IE "MBMS Preferred frequency information" or when specified explicitly e.g. as in subclause 8.6.9.2, or when the priority for an MBMS service as indicated by upper layers changes.

The UE shall:

1> if there exist two or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES:

2> request from upper layers the priorities of the different MBMS services included in variable MBMS_ACTIVATED_SERVICES for which a preferred frequency has been received.

1> if the UE is in idle mode:

2> if a preferred frequency layer applies for a service included in variable MBMS_ACTIVATED_SERVICES:

3> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists as the preferred frequency.

….

1> if a preferred frequency has been selected:

2> if the UE is not in CELL_DCH state:

3> apply the cell-reselection procedure as described in [4], using the received "MBMS Preferred frequency information" applicable to the selected frequency:

4> if HCS is not used, and the IE "Qoffmbms" is not present for the MBMS preferred frequency:

5> consider the cells on the MBMS preferred frequency having a Qoffmbms equal to "infinity".

4> if HCS is used, and the IE "HCS_OFFmbms" is not present for the MBMS preferred frequency:

5> consider the cells on the MBMS preferred frequency having the highest HCS priority level.

3> if the UE re-selects to a cell on the indicated preferred frequency:

4> if the UE is in CELL_FACH, CELL_PCH or URA_PCH:

5> act according to subclause 8.3.1.2.

4> store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

4> apply the MCCH acquisition procedure, as specified in subclause 8.7.2.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

1> if the "MBMS required UE action" is set to 'None':

2> take no action with respect to this IE.

1> if the IE "MBMS required UE action" is set to 'Acquire counting info' or set to 'Acquire counting info – PTM RBs unmodified':

2> perform the MBMS counting procedure as specified in subclause 8.7.4;

NOTE: If upper layers indicate that an MBMS transmission has already been received correctly, the UE will continue as if the information about the concerned MBMS transmission was not included in the message. This implies that the UE does not respond to counting for a transmission already received correctly.

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

2> stop receiving the concerned MBMS service;

2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

2> if the UE does not decide to receive an MBMS service; and

2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

4> select a suitable UTRA cell in that frequency.

4> if no suitable UTRA cell in that frequency is found:

5> select a suitable UTRA cell in another frequency.

3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

5> select a suitable UTRA cell in the selected frequency

5> if no suitable UTRA cell in the selected frequency is found:

6> select a suitable UTRA cell in another frequency.

3> clear the variable MBMS_PREV_FREQUENCY_INFO.

2> clear all service specific information applicable for the concerned service.

NOTE: The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

…

If the UE is receiving an MBMS service that is not included in variable MBMS_ACTIVATED_SERVICES and that is using a p-t-m radio bearer, the UE shall:

1> stop receiving the concerned MBMS service and clear all service specific information applicable for the concerned service.

Upon completing the reception of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages, the UE shall

1> act as follows for each of the services included in these messages provided that the service is included in variable MBMS_ACTIVATED_SERVICES and upper layers indicate that the session has not yet been received correctly (referred to as 'applicable services');

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if one or more preferred frequency applies for the applicable services:

2> delay acting upon the "MBMS Preferred frequency information" until receiving the relevant MCCH information i.e. the MBMS GENERAL INFORMATION message;

2> act upon the "MBMS Preferred frequency information" as specified in subclause 8.6.9.4 for the service(s) that upper layers indicate to have highest priority.

1> perform MBMS frequency selection procedure as specified in subclause 8.5.27;

1> if the UE receives an MBMS service using a p-t-m radio bearer and the received messages do not contain an IE "MBMS required UE action" set to "Acquire PTM RB info" or set to "Acquire counting info – PTM RBs unmodified" for that service then the UE shall:

2> stop receiving the concerned MBMS service and clear all service specific information applicable for the concerned service.

…

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

1> otherwise if the UE performs connection establishment for MBMS counting as specified in subclause 8.7.4; and

1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

Reference

3GPP TS 25.331 clauses 8.5.27, 8.6.9.6, 8.7.2.4, 8.1.3.3.

8.5.3.1.3 Test purpose

To verify that in idle mode, the UE at session start, re-selects to the preferred Frequency Layer for the MBMS services it has activated.

To verify that at session stop the UE re-selects to the frequency where it has previously camped.

8.5.3.1.4 Method of test

Initial condition

System Simulator:

2 MBMS (Cell 21, Cell 24).

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No.


Test procedure

The UE receives, at notification via MCCH, an MBMS MODIFIED SERVICES INFORMATION message including a preferred frequency in the IE "MBMS preferred frequency".

The UE shall consider this frequency as the preferred frequency layer for cell re-selection and re-select to Cell 24 at session start for the MBMS service it has activated. The UE shall store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

The UE shall perform the MCCH acquisition procedure on the new cell.

The SS transmits an MBMS MODIFIED SERVICE INFORMATION message which includes in the "Modified service list" for the MBMS activated service "MBMS required UE action" set to "Acquire counting info" and MBMS ACCESS INFORMATION message, which includes the MBMS Short Transmission ID associated to the MBMS activated service and "Access probability factor – Idle" set to 0 (corresponds to an actual Probability Factor = 1).

The UE shall transmit an RRC CONNECTION REQUEST message, with "Establishment cause" set to "MBMS reception". The SS transmits a RRC CONNECTION SETUP. The UE establishes an RRC connection and transmits an RRC CONNECTION SETUP COMPLETE message.

The UE receives an MBMS MODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to "Acquire PTM RB info". The UE shall apply the MBMS p-t-m radio bearer configuration procedure to acquire the radio bearer configuration for the MBMS service provided by the SS.

The UE starts receiving the indicated p-t-m radio bearer.

The UE receives an MBMS MODIFIED SERVICES INFORMATION message with IE "MBMS required UE action" set to "Release PTM RB". The UE shall stop receiving the concerned MBMS service. The variable MBMS_PREV_FREQUENCY_INFO is not empty, and any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO, therefore the UE shall select Cell 21 (suitable UTRA cell in that frequency).

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----------|-----|---------|----------|
| Step | Direction | | Message | Comments |
|      | UE | SS | | |
| 1 | | | | The UE is in Idle mode on cell 21. |
| 2 | ← | | MBMS MODIFIED SERVICES INFORMATION | Service_id = service activated "MBMS required UE action is set to "none (FLC)" and PFL index is set to the index of the frequency of f2 in the preferred frequency list in MBMS GENERAL INFORMATION. |
| 3 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information is set to f2. |
| 4 | | | | The UE re-selects to cell 24. The SS allows 2 modification periods for the UE to reselect before sending the following messages on cell 24. |

| Step | Direction | | Message | Comments |
|------|-----------|-----|---------|----------|
| Step | Direction | | Message | Comments |
| | UE | SS | | |
| 5 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info". |
| 6 | | ← | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 7 | | ← | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE set to 1, "Access probability factor – Idle" set to 0 (corresponding to the actual probability factor value 1). SS sends MBMS ACCESS INFORMATION throughout the modification period as defined in 34.108 clause 11.1.2 |
| 8 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS reception" and in case of MBMS Selected service with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 9 | | ← | RRC CONNECTION SETUP | |
| 10 | → | | RRC CONNECTION SETUP COMPLETE | |
| 10a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure in case of MBMS Selected service. This message may be received at any point after step 10 and before step 12. |
| 11 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 12 | | ← | RRC CONNECTION RELEASE | |
| 13 | → | | RRC CONNECTION RELEASE COMPLETE | The UE shall enter idle mode. |
| 14 | | SS | | The following MBMS messages sent on the MCCH will be received in the next Modification Period. |
| 15 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 16 | | ← | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 17 | | SS | | The following MBMS messages sent on the MCCH will be received in a new Modification Period. |
| 18 | | ← | VOID | |
| 19 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Release PTM RB". |
| 20 | | | | The UE stops receiving the concerned MBMS service and reselects to Cell 21. |
| 21 | ←→ | | CALL C.1 | If the test result of C.1 indicates that UE is in Idle Mode state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 2)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | None (FLC) |
| - MBMS preferred frequency | |
| - PFL index | Index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION(Step 3)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information | Only 1 entry |
| MBMS preferred frequency list | |
| - MBMS preferred frequency | Value N corresponds with the $n^{th}$ frequency included in the IE New inter-frequency cells that is specified within SIB 11, corresponding to cell 24 frequency (f2). |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | Infinity |

MBMS MODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| -MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| -MBMS required UE action | Acquire counting info |
| - MBMS preferred frequency | - |
| - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Steps 6 and 16)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information | Only 1 entry |
| MBMS preferred frequency list | |
| - MBMS preferred frequency | Not present (indicates PFL is current cell frequency) |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | Infinity |

MBMS ACCESS INFORMATION (Step 7)

| Information Element | Value/remark |
|---|---|
| Service list | Only 1 entry |
| - MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| - Access probability factor - Idle | 0 (corresponding to the actual probability factor value 1) |
| - Connected mode counting scope | |
| - URA_PCH | FALSE |
| - CELL_PCH | FALSE |
| - CELL_FACH | FALSE |

MBMS MODIFICATION REQUEST (steps 10a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
|   - MBMS Selected Services Full | |
|     - MBMS Selected Service ID | Only 1 entry |
|      - MBMS Service ID | MBMS service ID of the activated MBMS service |
|      - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|        - SameAs-MIB | (no data) |
|        - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

MBMS MODIFIED SERVICES INFORMATION (Step 15)

| Information Element | Value/remark |
|---|---|
| Modified service list | 1 |
| -MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| -MBMS required UE action | Acquire PTM RB info |
| - MBMS preferred frequency | - |
|  - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

MBMS MODIFIED SERVICES INFORMATION (Step 19)

| Information Element | Value/remark |
|---|---|
| Modified service list | 1 |
| -MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| -MBMS required UE action | 'Release PTM RB' |

#### 8.5.3.1.1.5 Test requirements

At step 8, the UE shall send an RRC CONNECTION REQUEST message on Cell 24 with Establishment cause set to "MBMS reception".

At step 21, the test result of C.1 shall indicate that the UE is in idle mode on Cell 21.

### 8.5.3.1m MBMS Session Start (Frequency Layer Convergence)/Session Stop (Frequency Layer Dispersion) in Idle mode / MBMS Multicast Service

#### 8.5.3.1m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.3.1m.2 Conformance requirement

Same conformance requirement as in clause 8.5.3.1.2

#### 8.5.3.1m.3 Test purpose

Same test purpose as in clause 8.5.3.1.3.

#### 8.5.3.1m.4 Method of test

Initial condition

System Simulator:

    2 MBMS cells, Cell 21, Cell 24.

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.3.1.4, except that at step 11 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.3.1.4

### 8.5.3.1m.5 Test requirements

Same test requirement as in clause 8.5.3.1.5.

## 8.5.3.2 MBMS Session Start (Frequency Layer Convergence)/Session Stop (Frequency Layer Dispersion) in CELL_PCH / MBMS Broadcast Service

### 8.5.3.2.1 Definition

This test is applicable for all UEs supporting MBMS broadcast services.

### 8.5.3.2.2 Conformance requirement

The UE shall perform the MBMS frequency layer selection procedure upon receiving the IE "MBMS Preferred frequency information", when specified explicitly e.g. as in subclause 8.6.9.2, or when the preferred MBMS service changes.

The UE shall:

1> if there exist two or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES:

2> request from upper layers the priorities of the different MBMS services included in variable MBMS_ACTIVATED_SERVICES for which a preferred frequency has been received.

1> if the UE is in idle mode:

2> if a preferred frequency layer applies for a service included in variable MBMS_ACTIVATED_SERVICES:

3> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists as the preferred frequency.

1> if the UE is in CELL_FACH, CELL_PCH or URA_PCH state; and

1> if there exists one or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES and the variable MBMS_PL_SERVICE_RESTRICTION_INFO_DEDICATED is set to FALSE:

2> if the IE "RAB information" in the variable ESTABLISHED_RABS is not empty:

3> if the current frequency is the frequency corresponding with the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists:

4> select the current frequency as the preferred frequency.

3> else:

4> if there exists one or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES for which the IE "MBMS PL Service Restriction Information" has not been received in the MBMS GENERAL INFORMATION message:

5> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists for which the IE "MBMS PL Service Restriction Information" has not been received in the MBMS GENERAL INFORMATION message as the preferred frequency.

2> else:

3> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists as the preferred frequency.

…

1> if a preferred frequency has been selected:

2> if the UE is not in CELL_DCH state:

3> apply the cell-reselection procedure as described in [4], using the received "MBMS Preferred frequency information" applicable to the selected frequency:

4> if HCS is not used, and the IE "Qoffmbms" is not present for the MBMS preferred frequency:

5> consider the cells on the MBMS preferred frequency having a Qoffmbms equal to "infinity".

4> if HCS is used, and the IE "HCS_OFFmbms" is not present for the MBMS preferred frequency:

5> consider the cells on the MBMS preferred frequency having the highest HCS priority level.

3> if the UE re-selects to a cell on the indicated preferred frequency:

4> if the UE is in CELL_FACH, CELL_PCH or URA_PCH:

5> act according to subclause 8.3.1.2.

4> store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

4> apply the MCCH acquisition procedure, as specified in subclause 8.7.2.

1> else:

2> if the UE is not in CELL_DCH state:

3> stop applying any "MBMS Preferred frequency information".

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

1> if the "MBMS required UE action" is set to 'None':

2> take no action with respect to this IE.

1> if the IE "MBMS required UE action" is set to 'Acquire counting info' or set to 'Acquire counting info – PTM RBs unmodified':

2> perform the MBMS counting procedure as specified in subclause 8.7.4;

NOTE: If upper layers indicate that an MBMS transmission has already been received correctly, the UE will continue as if the information about the concerned MBMS transmission was not included in the message. This implies that the UE does not respond to counting for a transmission already received correctly.

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

2> stop receiving the concerned MBMS service;

2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

2> if the UE does not decide to receive an MBMS service; and

2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

4> select a suitable UTRA cell in that frequency.

4> if no suitable UTRA cell in that frequency is found:

5> select a suitable UTRA cell in another frequency.

3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

5> select a suitable UTRA cell in the selected frequency.

5> if no suitable UTRA cell in the selected frequency is found:

6> select a suitable UTRA cell in another frequency.

3> clear the variable MBMS_PREV_FREQUENCY_INFO.

2> clear all service specific information applicable for the concerned service.

NOTE:    The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

…

If the UE is receiving an MBMS service that is not included in variable MBMS_ACTIVATED_SERVICES and that is using a p-t-m radio bearer, the UE shall:

1> stop receiving the concerned MBMS service and clear all service specific information applicable for the concerned service.

Upon completing the reception of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages, the UE shall

1> act as follows for each of the services included in these messages provided that the service is included in variable MBMS_ACTIVATED_SERVICES and upper layers indicate that the session has not yet been received correctly (referred to as 'applicable services');

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if one or more preferred frequency applies for the applicable services:

2> delay acting upon the "MBMS Preferred frequency information" until receiving the relevant MCCH information i.e. the MBMS GENERAL INFORMATION message;

2> act upon the "MBMS Preferred frequency information" as specified in subclause 8.6.9.4 for the service(s) that upper layers indicate to have highest priority.

1> perform MBMS frequency selection procedure as specified in subclause 8.5.27;

1> if the UE receives an MBMS service using a p-t-m radio bearer and the received messages do not contain an IE "MBMS required UE action" set to "Acquire PTM RB info" or set to "Acquire counting info – PTM RBs unmodified" for that service then the UE shall:

2> stop receiving the concerned MBMS service and clear all service specific information applicable for the concerned service.

Reference

3GPP TS 25.331 clauses 8.5.27, 8.6.9.6, 8.7.2.4.

8.5.3.2.3 Test purpose

To verify that in CELL_PCH, the UE at session start re-selects to the preferred Frequency Layer for the MBMS services it has activated.

To verify that at session stop the UE re-select to the frequency where it has previously camped.

8.5.3.2.4 Method of test

Initial condition

System Simulator:

System Simulator: 2 MBMS cells, Cell21 and Cell24

User Equipment:

The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No.

Test procedure

The UE receives, at notification via MCCH, an MBMS MODIFIED SERVICES INFORMATION message including a preferred frequency in the IE "MBMS preferred frequency".

The UE shall consider this frequency as the preferred frequency layer for cell re-selection and re-select to Cell 24 at session start for the MBMS service it has activated. The UE shall store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

The UE shall perform the MCCH acquisition procedure on the new cell.

The UE shall transmit a CELL UPDATE message on the uplink CCCH of Cell 24 and set IE "Cell update cause" to "cell reselection".

After the SS receives this message, it transmits a CELL UPDATE CONFIRM message to the UE on the downlink CCCH. The UE shall move to the CELL_PCH state as indicated by the IE "RRC State Indicator".

The UE receives a MBMS MODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to Acquire PTM RB info". The UE shall apply the MBMS p-t-m radio bearer configuration procedure to acquire the radio bearer configuration for the MBMS services the UE has activated.

The UE start receiving the indicated p-t-m radio bearer.

The UE receives a MBMS MODIFIED SERVICES INFORMATION message with IE "MBMS required UE action" set to 'Release PTM RB'. The UE shall stop receiving the concerned MBMS service. The variable MBMS_PREV_FREQUENCY_INFO is not empty, and any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO , therefore the UE shall select cell 21 (suitable UTRA cell in that frequency).

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | **UE** | **SS** | | |
| 1 | UE | | | The UE is in CELL_PCH on cell 21. |
| 2 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "none" and the "MBMS preferred frequency" IE indicates the reference to f2. |
| 3 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information is set to f2. |
| 4 | UE | | | The UE re-selects to cell 24. |
| 5 | → | | CELL UPDATE | The CELL UPDATE message shall contain the value "Cell Update Cause" set to "cell reselection" |
| 6 | ← | | CELL UPDATE CONFIRM | IE "RRC State Indicator is set to CELL_PCH. |
| 7 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 8 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 9 | | | VOID | |
| 10 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Release PTM RB" |
| 11 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 12 | ← | | SYSTEM INFORMATION BLOCK TYPE 12 SYSTEM INFORMATION BLOCK TYPE 11 | The cell 24 contains cell 21 in SIB11 and SIB12. |
| 13 | UE | | | The UE stops receiving the concerned MBMS services and re-selects to cell 21. |
| 14 | → | | CELL UPDATE | The CELL UPDATE message shall contain the value "Cell Update Cause" set to "cell reselection" |
| 15 | ← | | CELL UPDATE CONFIRM | IE "RRC State Indicator is set to CELL_PCH. |
| 16 | ←→ | | CALL C.4 | If the test result of C.4 indicates that UE is in CELL_PCH state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 2)

| Information Element | Value/remark |
|---|---|
| Modified service list<br>- MBMS Transmission identity | At least the entry including the activated service<br>MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action<br> - MBMS preferred frequency | None |
| - PFL index | Index for f2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |

MBMS GENERAL INFORMATION (Step 3)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information | |
| - MBMS preferred frequency list | Only 1 Entry |
| - CHOICE Layer convergence information | f2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |

CELL UPDATE (Step 5 and 14)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| Cell update cause | cell reselection |

CELL UPDATE CONFIRM (Step 6 and 15)

| Information Element | Value/remark |
|---|---|
| RRC State Indicator | CELL_PCH |
| UTRAN DRX cycle length coefficient | 7 |

MBMS MODIFIED SERVICES INFORMATION (Step 7)

| Information Element | Value/remark |
|---|---|
| Modified service list<br>- MBMS Transmission identity | At least the entry including the activated service<br>MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB' |
| - MBMS preferred frequency | - |
| - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Steps 8 and 11)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information<br>MBMS preferred frequency list | Only 1 entry |
| - MBMS preferred frequency | Not present (indicates PFL is current cell frequency) |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | Infinity |

MBMS MODIFIED SERVICES INFORMATION (Step 10)

| Information Element | Value/remark |
|---|---|
| Modified service list<br>- MBMS Transmission identity | At least the entry including the activated service<br>MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | 'Release PTM RB' |

### 8.5.3.2.5 Test requirements

At step 5, the UE shall perform the cell update procedure using the cause value "MBMS reception" set to "cell reselection" on cell 24.

At step 14, the UE shall perform the cell update procedure using the cause value "MBMS reception" set to "cell reselection" on cell 21.

At step 16, the procedure C.4 shall verify that the UE is in CELL_PCH state.

## 8.5.3.2m MBMS Session Start (Frequency Layer Convergence)/Session Stop (Frequency Layer Dispersion) in CELL_PCH / MBMS Multicast Service

### 8.5.3.2m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.3.2m.2 Conformance requirement

Same conformance requirement as in clause 8.5.3.2.2

### 8.5.3.2m.3 Test purpose

Same test purpose as in clause 8.5.3.2.3.

### 8.5.3.2m.4 Method of test

Initial condition

System Simulator:

 2 MBMS cells, Cell 21, Cell 24.

User Equipment:

 The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

 The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

 - MBMS Multicast service application available on UE    Yes/No.

Test procedure

Same test procedure as in clause 8.5.3.2.4.

Specific message contents

Same specific messages contents as in clause 8.5.3.2.4

### 8.5.3.2m.5 Test requirements

Same test requirement as in clause 8.5.3.2.5.

### 8.5.3.3 MBMS Session Start (Frequency Layer Convergence)/Session Stop (Frequency Layer Dispersion) in CELL_FACH / MBMS Broadcast Service

#### 8.5.3.3.1 Definition

This test is applicable for all UEs supporting MBMS broadcast services.

#### 8.5.3.3.2 Conformance requirement

The UE shall perform the MBMS frequency layer selection procedure upon receiving the IE "MBMS Preferred frequency information", when specified explicitly e.g. as in subclause 8.6.9.2, or when the preferred MBMS service changes.

The UE shall:

1> if there exist two or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES:

2> request from upper layers the priorities of the different MBMS services included in variable MBMS_ACTIVATED_SERVICES for which a preferred frequency has been received.

1> if the UE is in idle mode:

2> if a preferred frequency layer applies for a service included in variable MBMS_ACTIVATED_SERVICES:

3> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists as the preferred frequency.

1> if the UE is in CELL_FACH, CELL_PCH or URA_PCH state; and

1> if there exists one or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES and the variable MBMS_PL_SERVICE_RESTRICTION_INFO_DEDICATED is set to FALSE:

2> if the IE "RAB information" in the variable ESTABLISHED_RABS is not empty:

3> if the current frequency is the frequency corresponding with the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists:

4> select the current frequency as the preferred frequency.

3> else:

4> if there exists one or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES for which the IE "MBMS PL Service Restriction Information" has not been received in the MBMS GENERAL INFORMATION message:

5> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists for which the IE "MBMS PL Service Restriction Information" has not been received in the MBMS GENERAL INFORMATION message as the preferred frequency.

2> else:

3> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists as the preferred frequency.

…

1> if a preferred frequency has been selected:

2> if the UE is not in CELL_DCH state:

3> apply the cell-reselection procedure as described in [4], using the received "MBMS Preferred frequency information" applicable to the selected frequency:

4> if HCS is not used, and the IE "Qoffmbms" is not present for the MBMS preferred frequency:

5> consider the cells on the MBMS preferred frequency having a Qoffmbms equal to "infinity".

4> if HCS is used, and the IE "HCS_OFFmbms" is not present for the MBMS preferred frequency:

5> consider the cells on the MBMS preferred frequency having the highest HCS priority level.

3> if the UE re-selects to a cell on the indicated preferred frequency:

4> if the UE is in CELL_FACH, CELL_PCH or URA_PCH:

5> act according to subclause 8.3.1.2.

4> store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

4> apply the MCCH acquisition procedure, as specified in subclause 8.7.2.

1> else:

2> if the UE is not in CELL_DCH state:

3> stop applying any "MBMS Preferred frequency information".

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

1> if the "MBMS required UE action" is set to 'None':

2> take no action with respect to this IE.

1> if the IE "MBMS required UE action" is set to 'Acquire counting info' or set to 'Acquire counting info – PTM RBs unmodified':

2> perform the MBMS counting procedure as specified in subclause 8.7.4;

NOTE: If upper layers indicate that an MBMS transmission has already been received correctly, the UE will continue as if the information about the concerned MBMS transmission was not included in the message. This implies that the UE does not respond to counting for a transmission already received correctly.

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

2> stop receiving the concerned MBMS service;

2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

2> if the UE does not decide to receive an MBMS service; and

2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

> 3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

>> 4> select a suitable UTRA cell in that frequency.

>> 4> if no suitable UTRA cell in that frequency is found:

>>> 5> select a suitable UTRA cell in another frequency.

> 3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

>> 4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

>>> 5> select a suitable UTRA cell in the selected frequency.

>>> 5> if no suitable UTRA cell in the selected frequency is found:

>>>> 6> select a suitable UTRA cell in another frequency.

> 3> clear the variable MBMS_PREV_FREQUENCY_INFO.

> 2> clear all service specific information applicable for the concerned service.

NOTE:     The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

…

If the UE is receiving an MBMS service that is not included in variable MBMS_ACTIVATED_SERVICES and that is using a p-t-m radio bearer, the UE shall:

> 1> stop receiving the concerned MBMS service and clear all service specific information applicable for the concerned service.

Upon completing the reception of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages, the UE shall

> 1> act as follows for each of the services included in these messages provided that the service is included in variable MBMS_ACTIVATED_SERVICES and upper layers indicate that the session has not yet been received correctly (referred to as 'applicable services');

> 1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

> 1> if one or more preferred frequency applies for the applicable services:

>> 2> delay acting upon the "MBMS Preferred frequency information" until receiving the relevant MCCH information i.e. the MBMS GENERAL INFORMATION message;

>> 2> act upon the "MBMS Preferred frequency information" as specified in subclause 8.6.9.4 for the service(s) that upper layers indicate to have highest priority.

> 1> perform MBMS frequency selection procedure as specified in subclause 8.5.27;

> 1> if the UE receives an MBMS service using a p-t-m radio bearer and the received messages do not contain an IE "MBMS required UE action" set to "Acquire PTM RB info" or set to "Acquire counting info – PTM RBs unmodified" for that service then the UE shall:

>> 2> stop receiving the concerned MBMS service and clear all service specific information applicable for the concerned service.

Reference

3GPP TS 25.331 clauses 8.5.27, 8.6.9.6, 8.7.2.4.

8.5.3.3.3                  Test purpose

To verify that in CELL_FACH, the UE at session start re-selects to the preferred Frequency Layer for the MBMS services it has activated.

To verify that at session stop the UE re-select to the one of the frequencies indicated in the System Information.

8.5.3.3.4                  Method of test

Initial condition

System Simulator:

    3 MBMS cells, Cell 21, Cell 24 and Cell 27

**Table 8.5.3.3-1**

| Parameter | Unit | Cell 21 | Cell 24 | Cell 27 |
|---|---|---|---|---|
| UTRA RF Channel Number | | f1 | f2 | f3 |
| Test Frequency ID | | Mid Range | High Range | Low Range |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | -66 | -66 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -66 | -66 |

User Equipment:

    The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

    The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

    -    MBMS Broadcast service application available on UE    Yes/No.

Test procedure

SS broadcasts SYSTEM INFORMATION BLOCK TYPE 11 with FACH Measurement Occasion details on Cell 21. The UE receives, at notification via MCCH, an MBMS MODIFIED SERVICES INFORMATION message including a preferred frequency in the IE "MBMS preferred frequency".

The UE shall consider this frequency as the preferred frequency layer for cell re-selection and re-select to Cell 24 at session start for the MBMS service it has activated. The UE shall store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

The UE shall perform the MCCH acquisition procedure on the new cell.

The UE shall transmit a CELL UPDATE message on the uplink CCCH of Cell 24 and set IE "Cell update cause" to "cell reselection".

After the SS receives this message, it transmits a CELL UPDATE CONFIRM message to the UE on the downlink CCCH. The UE shall stay in CELL_FACH state as indicated by the IE "RRC State Indicator".

The UE receives a MBMS MODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to Acquire PTM RB info". The UE shall apply the MBMS p-t-m radio bearer configuration procedure to acquire the radio bearer configuration for the MBMS services the UE has activated.

The UE starts receiving the indicated p-t-m radio bearer and in order to check this, loop back mode 3 is used.

The UE receives a MBMS MODIFIED SERVICES INFORMATION message with IE "MBMS required UE action" set to 'Release PTM RB'. The UE shall stop receiving the concerned MBMS service. The variable MBMS_PREV_FREQUENCY_INFO is not empty. The frequencies in SIB11 or SIB12 are different from the frequency stored in the variable MBMS_PREV_FREQUENCY_INFO therefore the UE shall select Cell 27 (suitable UTRA cell in the indicated frequency) even if Cell 21 is present.

Expected sequence

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 1 | UE | | | The UE is in CELL_FACH on Cell 21. |
| 1a | ← | | SYSTEM INFORMATION BLOCK TYPE 11 | SS transmits modified SIB 11, with contents given in specific message contents. |
| 2 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "none" and the "MBMS preferred frequency" IE indicates the f2. |
| 3 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information is set to f2. |
| 4 | UE | | | The UE re-selects to Cell 24. |
| 5 | → | | CELL UPDATE | The CELL UPDATE message shall contain the value "Cell Update Cause" set to "cell reselection" |
| 6 | ← | | CELL UPDATE CONFIRM | IE "RRC State Indicator is set to CELL_FACH. |
| 6a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |
| 7 | ← | | ACTIVATE RB TEST MODE | The SS activates the RB TEST MODE |
| 8 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 9 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 10 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 11 | ← | | CLOSE UE TEST LOOP | The SS closes the Loop back mode 3 on MTCH. |
| 12 | → | | CLOSE UE TEST LOOP COMPLETE | |
| 13 | SS | | | The SS starts to broadcast MBMS data on MTCH on the concerned MBMS radio bearer. The SS transmits 10 RLC SDUs on the MTCH.. |
| 14 | ← | | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 15 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data. |
| 16 | ← | | OPEN UE TEST LOOP | |
| 17 | → | | OPEN UE TEST LOOP COMPLETE | |
| 18 | ← | | SYSTEM INFORMATION BLOCK TYPE 11 | Sent on cell 24, with Cell 27, but not the frequency of cell 21 in the neighbour list. |
| 19 | ← | | SYSTEM INFORMATION BLOCK TYPE 4 | Sent on cell 27. Qhyst1$_s$ is set to 12dB in SIB4, to prevent reselection from this cell. |
| 20 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Release PTM RB". The UE stops receiving the concerned MBMS services and re-selects to Cell 27 |
| 21 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 22 | → | | CELL UPDATE | The CELL UPDATE message shall contain the value "Cell Update Cause" set to "cell reselection" |
| 23 | ← | | CELL UPDATE CONFIRM | "RRC State Indicator is set to CELL_FACH. |
| 23a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |
| 24 | ←→ | | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific message contents

SYSTEM INFORMATION BLOCK TYPE 11 (Step 1a)(FDD)

Use the message sub-type in default message content defined in 3GPP TS 34.108 clause 6.1.4 for Cell 21, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| FACH measurement occasion info<br>  - FACH Measurement occasion cycle length coefficient | 3 |
|    - Inter-frequency FDD measurement indicator | TRUE |
|    - Inter-frequency TDD measurement indicator | FALSE |
|    - Inter-RAT measurement indicators | Not Present |

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 2)

| Information Element | Value/remark |
|---|---|
| Modified service list<br>- MBMS Transmission identity | At least the entry including the activated service<br>MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | None |
| - MBMS preferred frequency<br> - PFL index | Index for f2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |

MBMS GENERAL INFORMATION (Step 3)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information<br>- MBMS preferred frequency list<br> - CHOICE Layer convergence information | Only 1 Entry<br>f2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |

CELL UPDATE (Step 5 and 22)

| Information Element | Value/remark |
|---|---|
| Cell update cause | cell reselection |

CELL UPDATE CONFIRM (Step 6 and 23)

Use the same message sub-type found in TS 34.108, clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| New C-RNTI | '1010 1010 1010 1010' |

MBMS MODIFIED SERVICES INFORMATION (Step 9)

| Information Element | Value/remark |
|---|---|
| Modified service list<br>- MBMS Transmission identity | At least the entry including the activated service<br>MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | 'Acquire PTM RB' |
| - MBMS preferred frequency<br> - PFL index | -<br>Set to the index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Steps 10 and 21)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information<br>MBMS preferred frequency list | Only 1 entry |
| - MBMS preferred frequency | Not present (indicates PFL is current cell frequency) |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | Infinity |

SYSTEM INFORMATION BLOCK TYPE 11 (Step 18)(FDD)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 6.1.4 for Cell 24, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| **- Inter-frequency measurement system information** | |
| …..<br>    - Inter frequency cell id | 27 |
|    - Frequency info | Same content as specified for Inter-frequency cell id=7 in SIB11 for Cell 7 in clause 6.1.4.2 |
|    - Cell info | Same content as specified for Intra-frequency cell id=7 in SIB11 for Cell 1 in clause 6.1.0b with the exception that value for Primary scrambling code shall be according to clause titled "Default settings for cell No.27 (TDD)" in clause 6.1.4.3 |
|    - Inter frequency cell id | 28 |
|    - Frequency info | Not present |
|    - Cell info | Same content as specified for Intra-frequency cell id=8 in SIB11 for Cell 1 in clause 6.1.0b with the exception that value for Primary scrambling code shall be according to clause titled "Default settings for cell No.28 (TDD)" in clause 6.1.4.3 |
|    - Inter frequency cell id | 7 |
|    - Frequency info | Not Present |
|    - Cell info | Same content as specified for Inter-frequency cell id=7 in SIB11 for Cell 1 in clause 6.1.0b |
|    - Inter frequency cell id | 8 |
|    - Frequency info | Not present |
|    - Cell info | Same content as specified for Inter-frequency cell id=8 in SIB11 for Cell 1 in clause 6.1.0b |

SYSTEM INFORMATION BLOCK TYPE 11 (Step 18)(1.28Mcps TDD)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 6.1.4 for Cell 24, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| **- Inter-frequency measurement system information** | |
| …..<br>    - New inter-frequency cells | |
|    - Inter-frequency cell id | 1 |
|    - Frequency info | |
|      - UARFCN | Low Range |

SYSTEM INFORMATION BLOCK TYPE 4 (Step 19)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 6.1.4 for Cell 27, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| Cell selection and re-selection info | |
| - Qhyst1$_s$ | 6 (12dB) |

MBMS MODIFIED SERVICES INFORMATION (Step 20)

| Information Element | Value/remark |
|---|---|
| Modified service list | At least the entry including the activated service |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | 'Release PTM RB' |

#### 8.5.3.3.5 Test requirements

At step 5, the UE shall perform the cell update procedure on cell 24 using the cause value "cell reselection" set to "cell reselection".

At step 15, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message and the number of reported RLC SDUs shall be greater than zero.

At step 22, the UE shall perform the cell update procedure on cell 27 using the cause value "cell reselection".

At step 24 the procedure C.2 shall verify that the UE is in CELL_FACH state.

## 8.5.3.3m MBMS Session Start (Frequency Layer Convergence)/Session Stop (Frequency Layer Dispersion) in CELL_FACH / MBMS Multicast Service

#### 8.5.3.3m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.3.3m.2 Conformance requirement

Same conformance requirement as in clause 8.5.3.3.2

#### 8.5.3.3m.3 Test purpose

Same test purpose as in clause 8.5.3.3.3.

#### 8.5.3.3m.4 Method of test

Initial condition

System Simulator:

      3 MBMS cells, Cell 21, Cell 24 and Cell 27.

User Equipment:

      The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

      The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE     Yes/No.

Test procedure

Same test procedure as in clause 8.5.3.3.4.

Specific message contents

Same specific messages contents as in clause 8.5.3.3.4

#### 8.5.3.3m.5 Test requirements

Same test requirement as in clause 8.5.3.3.5.

### 8.5.3.4 MBMS Session Stop with Frequency Layer Dispersion - no previous frequency layer available (Idle Mode) / MBMS Broadcast Service

#### 8.5.3.4.1 Definition

This test is applicable for all UEs supporting MBMS broadcast services.

#### 8.5.3.4.2 Conformance requirement

1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

  2> stop receiving the concerned MBMS service;

  2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

  2> if the UE does not decide to receive an MBMS service; and

  2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

    3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

      4> select a suitable UTRA cell in that frequency.

      4> if no suitable UTRA cell in that frequency is found:

        5> select a suitable UTRA cell in another frequency.

    3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

      4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

        5> select a suitable UTRA cell in the selected frequency

        5> if no suitable UTRA cell in the selected frequency is found:

          6> select a suitable UTRA cell in another frequency.

    3> clear the variable MBMS_PREV_FREQUENCY_INFO.

  2> clear all service specific information applicable for the concerned service.

NOTE: The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

Reference

3GPP TS 25.331 clause 8.6.9.6.

#### 8.5.3.4.3 Test purpose

To verify that in idle mode state, the UE performs frequency layer dispersion procedure at session stop, when no suitable cell in the previously stored frequency is found.

#### 8.5.3.4.4 Method of test

Initial condition

System Simulator: 3 MBMS cells (Cell 21, Cell 24 and Cell 27), with the downlink transmission power shown in column marked "T0" in table 8.5.3.5-1.

User Equipment:

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No

Test procedure

Table 8.5.3.4-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while columns marked "T1 are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.5.3.4-1**

| Parameter | Unit | Cell 21 | | Cell 24 | | Cell 27 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | | Low Range Test Frequency | |
| LAC | | 0001 | | 0002 | | 0003 | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | OFF | -70 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | OFF | -70 | -70 | -70 | -60 |

Method C is applied (as described and used in clause 6 of TS 34.123-1).

The SS activates Cell 21, Cell 24 and Cell 27 and monitors them for access requests from the UE. The UE is in idle mode on Cell 21.The UE receives, at notification via MCCH, an MBMS MODIFIED SERVICES INFORMATION message including a preferred frequency in the IE" MBMS preferred frequency".

The UE shall consider this frequency as the preferred frequency layer for cell re-selection. The SS waits for random access requests from the UE. The UE moves to Cell 24 at session start for the concerned MBMS service. The UE shall store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

The UE shall perform the MCCH acquisition procedure on the new cell.

The UE receives an MBMS MODIFIED SERVICES INFORMATION message with the "MBMS required UE action" IE set to "Acquire PTM RB info". The UE shall apply the MBMS p-t-m radio bearer configuration procedure to acquire the radio bearer configuration for the MBMS service provided by the SS.

The UE starts receiving the indicated p-t-m radio bearer.

SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.4-1. The SS waits to see if there are any random access requests from the UE. The UE receives a MBMS MODIFIED SERVICES INFORMATION message with IE "MBMS required UE action" is set to 'Release PTM RB'. The UE shall stop receiving the concerned MBMS service. The variable MBMS_PREV_FREQUENCY_INFO is not empty, and no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO. The SS waits for random access requests from the UE. The UE shall select Cell 27 (suitable UTRA).

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE is in Idle mode on Cell 21. |
| 2 | | ← | MBMS MODIFIED SERVICES INFORMATION | Service_id = service activated "MBMS required UE action is set to "none (FLC)". |
| 3 | | ← | MBMS GENERAL INFORMATION | MBMS preferred frequency information is set to f4. |
| 4 | | | | The SS waits for random access requests from the UE. The UE shall respond on Cell 24, a GMM registration procedure is performed. |
| 5 | | | | The following MBMS messages sent on the MCCH will be received in the next Modification Period. |

| Step | Direction | | Message | Comments |
|------|:---:|:---:|---------|----------|
| | UE | SS | | |
| 6 | ← | | MBMS MODIFIED SERVICES INFORMATION | |
| 7 | ← | | MBMS UNMODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire PTM RB info". |
| 8 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 9 | | | | UE starts receiving the indicated p-t-m radio bearer |
| 10 | SS | | | The SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.4-1. |
| 11 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Release PTM RB". |
| 12 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 13 | | | | The UE stops receiving the concerned MBMS services. The SS waits for random access requests from the UE. The UE shall respond on Cell 27, a GMM registration procedure is performed. |
| 14 | ←→ | | CALL C.1 | If the test result of C.1 indicates that UE is in Idle Mode state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | None (FLC) |
| - MBMS preferred frequency | |
|   - PFL index | index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Step 3)

| Information Element | Value/remark |
|---------------------|--------------|
| MBMS preferred frequency information | |
| MBMS preferred frequency list | |
| - MBMS preferred frequency | Value N corresponds with the $n^{tn}$ frequency included in the IE New inter-frequency cells that is specified within SIB 11, corresponding to cell 24 frequency. |

MBMS UNMODIFIED SERVICES INFORMATION (Step 7)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |
| - MBMS preferred frequency | - |
|   - PFL index | index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Steps 8 and 12)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information | Only 1 entry |
| MBMS preferred frequency list | |
| - MBMS preferred frequency | Not present (indicates PFL is current cell frequency) |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | infinity |

MBMS MODIFIED SERVICES INFORMATION (Step 11)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | 'Release PTM RB' |

### 8.5.3.4.5 Test requirements

At step 4, the UE shall respond on Cell 24.

At step 13, the UE shall respond on Cell 27.

At step 14 the procedure C.1 shall verify that the UE is in Idle Mode.

## 8.5.3.4m MBMS Session Stop with Frequency Layer Dispersion - no previous frequency layer available (Idle Mode) / MBMS Multicast Service

### 8.5.3.4m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.3.4m.2 Conformance requirement

Same conformance requirement as in clause 8.5.3.4.2

### 8.5.3.4m.3 Test purpose

Same test purpose as in clause 8.5.3.4.3.

### 8.5.3.4m.4 Method of test

Initial condition

System Simulator:

> 3 MBMS cells, Cell 21, Cell 24 and Cell 27.

User Equipment:

> The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

> The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.3.4.4.

Specific message contents

Same specific messages contents as in clause 8.5.3.4.4

8.5.3.4m.5            Test requirements

Same test requirement as in clause 8.5.3.4.5.

## 8.5.3.5        MBMS Session Stop with Frequency Layer Dispersion - no previous frequency layer available (URA_PCH) / MBMS Broadcast Service

8.5.3.5.1            Definition

This test is applicable for all UEs supporting MBMS broadcast services.

8.5.3.5.2            Conformance requirement

1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

>> 2> stop receiving the concerned MBMS service;

>> 2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

>> 2> if the UE does not decide to receive an MBMS service; and

>> 2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

>>> 3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

>>>> 4> select a suitable UTRA cell in that frequency.

>>>> 4> if no suitable UTRA cell in that frequency is found:

>>>>> 5> select a suitable UTRA cell in another frequency.

>>> 3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

>>>> 4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

>>>>> 5> select a suitable UTRA cell in the selected frequency

>>>>> 5> if no suitable UTRA cell in the selected frequency is found:

>>>>>> 6> select a suitable UTRA cell in another frequency.

>>> 3> clear the variable MBMS_PREV_FREQUENCY_INFO.

>> 2> clear all service specific information applicable for the concerned service.

NOTE:        The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

Reference

3GPP TS 25.331, clause 8.6.9.6

8.5.3.5.3            Test purpose

To verify UE performs frequency layer dispersion procedure at session stop in URA_PCH state, when no suitable cell in the previously stored frequency is found.

8.5.3.5.4            Method of test

Initial condition

System Simulator:

3 MBMS cells, Cell 21, Cell 24 and Cell 27

User Equipment:

> The UE is in URA_PCH state as specified in clause 7.6 of TS 34.108.

> The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No

Test procedure

Table 8.5.3.5-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while columns marked "T1 are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.5.3.5-1**

| Parameter | Unit | Cell 21 | | Cell 24 | | Cell 27 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | | Low Range Test Frequency | |
| URA ID | | URA-ID 1 | | URA-ID 2 | | URA-ID 3 | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | OFF | -70 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | OFF | -70 | -70 | -70 | -60 |

The UE is in URA_PCH state on cell 21. SS indicates on MICH and modifies the MCCH to indicate the start of the service which the UE has activated. The UE moves to cell 24 with a cell update and begins reception of the MBMS service using the 64.8kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.5. The SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.5-1. The SS terminates the MBMS service with an indication that the UE should perform frequency layer dispersion. The UE moves to cell 27 with a cell update.

Expected Sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION (Cell 21) | SS indicates availability of the MBMS broadcast or multicast service on cell 24. (Preferred frequency for this service is set to the index of the frequency of Cell 24 in the preferred frequency list)<br><br>SS: MCCH message combination C4 for 1 modification period, then combination C2. |
| 2 | ← | | MBMS GENERAL INFORMATION (Cell 21) | MBMS Qoffset for the preferred frequency for this service set to infinity) |
| 3 | → | | URA UPDATE | UE reselects to cell 24. URA Update cause = "change of URA" |
| 4 | ← | | URA UPDATE CONFIRM | RRC State indicator = URA_PCH |
| 5 | ← | | MBMS UNMODIFIED SERVICES INFORMATION (Cell 24) | UE begins reception of the MBMS service using the 64.8kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.5.<br><br>SS: MCCH message combination C2. |
| 6 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 7 | | | | SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.5-1. |
| 8 | ← | | MBMS MODIFIED SERVICES INFORMATION (Cell 24) | The SS terminates the MBMS service with an indication to perform frequency layer dispersion.<br><br>SS: MCCH message combination C4 for 1 modification period. |
| 9 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 10 | → | | URA UPDATE | UE reselects to cell 27. URA Update cause = "change of URA" |
| 11 | ← | | URA UPDATE CONFIRM | RRC State indicator = URA_PCH |
| 12 | ←→ | | CALL C.5 | If the test result of C.5 indicates that UE is in URA_PCH state, the test passes, otherwise it fails |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

SYSTEM INFORMATION BLOCK TYPE 2

Cell 21:

| Information Element | Value/remark |
|---|---|
| - URA identity list | |
| - URA identity | 0000 0000 0000 0001B |

Cell 24:

| Information Element | Value/remark |
|---|---|
| - URA identity list | |
| - URA identity | 0000 0000 0000 0010B |

Cell 27:

| Information Element | Value/remark |
|---|---|
| - URA identity list | |
| - URA identity | 0000 0000 0000 0011B |

**MBMS MODIFIED SERVICES INFORMATION (Step 1)**

| Information Element | Value/remark |
|---|---|
| MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | None |
| MBMS preferred frequency | |
| - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

**MBMS GENERAL INFORMATION (Step 2)**

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency list | |
| MBMS preferred frequency | Value N corresponds with the $n^{th}$ frequency included in the IE New inter-frequency cells that is specified within SIB 11, corresponding to cell 24 frequency. |
| Layer convergence information | No HCS |
| MBMS Qoffset | Infinity |

**URA UPDATE (Steps 3 and 10)**

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
| - SRNC Identity | Check to see if set to '0000 0000 0001' |
| - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| URA Update Cause | Check to see if set to 'change of URA' |

**URA UPDATE CONFIRM (Steps 4 and 11)**

| Information Element | Value/remark |
|---|---|
| UTRAN DRX cycle length coefficient | 7 |

**MBMS UNMODIFIED SERVICES INFORMATION (Step 5)**

| Information Element | Value/remark |
|---|---|
| MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Acquire PTM RB info |
| MBMS preferred frequency | |
| - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

**MBMS GENERAL INFORMATION (Steps 6 and 9)**

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information | Only 1 entry |
| MBMS preferred frequency list | |
| - MBMS preferred frequency | Not present (indicates PFL is current cell frequency) |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | infinity |

MBMS MODIFIED SERVICES INFORMATION (Step 8)

| Information Element | Value/remark |
|---|---|
| MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Release PTM RB |

### 8.5.3.5.5 Test requirements

At step 3, the UE performs URA update on cell 24.

At step 10, the UE performs URA update on cell 27.

## 8.5.3.5m MBMS Session Stop with Frequency Layer Dispersion - no previous frequency layer available (URA_PCH) / MBMS Multicast Service

### 8.5.3.5m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.3.5m.2 Conformance requirement

Same conformance requirement as in clause 8.5.3.5.2

### 8.5.3.5m.3 Test purpose

Same test purpose as in clause 8.5.3.5.3.

### 8.5.3.5m.4 Method of test

Initial condition

System Simulator:

> 3 MBMS cells, Cell 21, Cell 24 and Cell 27. User Equipment:

> > The UE is in URA_PCH state as specified in clause 7.6 of TS 34.108.

> > The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.3.5.4.

Specific message contents

Same specific messages contents as in clause 8.5.3.5.4

### 8.5.3.5m.5 Test requirements

Same test requirement as in clause 8.5.3.5.5.

## 8.5.3.6 MBMS Session Stop with Frequency Layer Dispersion - no previous frequency layer available (CELL_FACH) / MBMS Broadcast Service

### 8.5.3.6.1 Definition

This test is applicable for all UEs supporting MBMS broadcast services.

### 8.5.3.6.2 Conformance requirement

> 1> if the IE "MBMS required UE action" is set to 'Release PTM RB':

2> stop receiving the concerned MBMS service;

2> if the UE is in a state other than CELL_DCH (for FDD) or if the UE is in Idle mode, URA_PCH or CELL_PCH state (for TDD); and

2> if the UE does not decide to receive an MBMS service; and

2> if the variable MBMS_PREV_FREQUENCY_INFO is not empty:

    3> if any frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO:

        4> select a suitable UTRA cell in that frequency.

        4> if no suitable UTRA cell in that frequency is found:

            5> select a suitable UTRA cell in another frequency.

    3> if no frequency in SIB11 or SIB12 has the same frequency stored in the variable MBMS_PREV_FREQUENCY_INFO.

        4> select a frequency randomly among the inter-frequencies indicated in SIB11 or SIB12.

            5> select a suitable UTRA cell in the selected frequency

            5> if no suitable UTRA cell in the selected frequency is found:

                6> select a suitable UTRA cell in another frequency.

    3> clear the variable MBMS_PREV_FREQUENCY_INFO.

2> clear all service specific information applicable for the concerned service.

NOTE: The UE is only required to acquire the relevant SIB11 or SIB12, according to what is specified in subclauses 8.1.1.6.11 and 8.1.1.6.12.

Reference

3GPP TS 25.331, clause 8.6.9.6.

### 8.5.3.6.3 Test purpose

To verify UE performs frequency layer dispersion procedure at session stop in CELL_FACH state, when no suitable cell in the previously stored frequency is found.

### 8.5.3.6.4 Method of test

Initial condition

System Simulator:

    3 MBMS cells, Cell 21, Cell 24 and Cell 27.

User Equipment:

    The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

    The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-   MBMS Broadcast service application available on UE    Yes/No

Test procedure

Table 8.5.3.6-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while columns marked "T1 are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.5.3.6-1**

| Parameter | Unit | Cell 21 | | Cell 24 | | Cell 27 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | | Low Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | OFF | -70 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | OFF | -70 | -70 | -70 | -60 |

The UE is in CELL_FACH state on cell 21. The SS broadcasts SYSTEM INFORMATION BLOCK TYPE 11 with FACH Measurement Occasion details on Cell 21. SS indicates on MICH and modifies the MCCH to indicate the start of the service which the UE has activated. The UE moves to cell 24 with a cell update and begins reception of the MBMS service using the 64.8kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.5. The SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.6-1. The SS terminates the MBMS service with an indication that the UE should perform frequency layer dispersion. The UE moves to cell 27 with a cell update.

Expected Sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 0 | | ← | SYSTEM INFORMATION BLOCK TYPE 11 | SS transmits modified SIB 11, with contents given in specific message contents. |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION (Cell 21) | SS indicates availability of the MBMS broadcast or multicast service on Cell 24. (Preferred frequency for this service is set to the index of the frequency of Cell 24 in the preferred frequency list)<br><br>SS: MCCH message combination C4 for 1 modification period, then combination C2. |
| 2 | | ← | MBMS GENERAL INFORMATION (Cell 21) | MBMS Qoffset for the preferred frequency for this service set to infinity |
| 3 | → | | CELL UPDATE | UE reselects to Cell 24. Cell Update cause = "Cell reselection" |
| 4 | | ← | CELL UPDATE CONFIRM | RRC State indicator = CELL_FACH |
| 4a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |
| 5 | | ← | MBMS UNMODIFIED SERVICES INFORMATION (Cell 24) | UE begins reception of the MBMS service using the 64.8kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.5.<br><br>SS: MCCH message combination C2. |
| 6 | | ← | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 7 | | | | SS reconfigures itself according to the settings stated in column "T1" of table 8.5.3.6-1. |
| 8 | | ← | MBMS MODIFIED SERVICES INFORMATION (Cell 24) | The SS terminates the MBMS service.<br><br>SS: MCCH message combination C4 for 1 modification period. |
| 9 | | ← | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 10 | → | | CELL UPDATE | UE reselects to Cell 27. Cell Update cause = "Cell reselection" |
| 11 | | ← | CELL UPDATE CONFIRM | RRC State indicator = CELL_FACH |
| 11a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |

| 12 | ↔ | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |
|----|---|----------|-----------------------------------------------------------------------------------------------------------|

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

SYSTEM INFORMATION BLOCK TYPE 11 (Step 0) (FDD)

Use the message sub-type in default message content defined in 3GPP TS 34.108 clause 6.1.4 for Cell 21, with the following exceptions.

| Information Element | Value/remark |
|---------------------|--------------|
| FACH measurement occasion info | |
| - FACH Measurement occasion cycle length coefficient | 3 |
| - Inter-frequency FDD measurement indicator | TRUE |
| - Inter-frequency TDD measurement indicator | FALSE |
| - Inter-RAT measurement indicators | Not Present |

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | None |
| MBMS preferred frequency | |
| - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| MBMS preferred frequency list | |
| MBMS preferred frequency | Value N corresponds with the $n^{th}$ frequency included in the IE New inter-frequency cells that is specified within SIB 11, corresponding to Cell 24 frequency. |
| Layer convergence information | No HCS |
| MBMS Qoffset | Infinity |

MBMS UNMODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark |
|---------------------|--------------|
| MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Acquire PTM RB info |
| MBMS preferred frequency | |
| - PFL index | Set to the index of the frequency of Cell 24 in the preferred frequency list |

MBMS GENERAL INFORMATION (Steps 6 and 9)

| Information Element | Value/remark |
|---------------------|--------------|
| MBMS preferred frequency information | Only 1 entry |
| MBMS preferred frequency list | |
| - MBMS preferred frequency | Not present (indicates PFL is current cell frequency) |
| - CHOICE Layer convergence information | No HCS |
| - Qoffmbms | infinity |

MBMS MODIFIED SERVICES INFORMATION (Step 8)

| Information Element | Value/remark |
|---|---|
| MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| MBMS required UE action | Release PTM RB |

CELL UPDATE (Step 3 and 10)

| Information Element | Value/remark |
|---|---|
| Cell Update Cause | 'Cell Reselection' |

CELL UPDATE CONFIRM (Step 4 and 11)

Use the same message sub-type found in TS 34.108, clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| New C-RNTI | '1010 1010 1010 1010' |

### 8.5.3.6.5 Test requirements

At step 3, the UE performs cell update on cell 24.

At step 10, the UE performs cell update on cell 27.

## 8.5.3.6m MBMS Session Stop with Frequency Layer Dispersion - no previous frequency layer available (CELL_FACH) / MBMS Multicast Service

### 8.5.3.6m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.3.6m.2 Conformance requirement

Same conformance requirement as in clause 8.5.3.6.2

### 8.5.3.6m.3 Test purpose

Same test purpose as in clause 8.5.3.6.3.

### 8.5.3.6m.4 Method of test

Initial condition

System Simulator:

   3 MBMS cells, Cell 21, Cell 24 and Cell 27

User Equipment:

   The UE is in CLL_FACH state as specified in clause 7.6 of TS 34.108.

   The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.3.6.4.

Specific message contents

Same specific messages contents as in clause 8.5.3.6.4

### 8.5.3.6m.5 Test requirements

Same test requirement as in clause 8.5.3.6.5.

## 8.5.4 MBMS Modification Request

### 8.5.4.1 Transmission of the MBMS Selected Services Information when entering RRC connected mode and CELL_DCH state / MBMS Selected Service

#### 8.5.4.1.1 Definition

This test is applicable for all UEs that support MBMS broadcast services.

#### 8.5.4.1.2 Conformance requirement

A UE entering CELL_DCH shall initiate the MBMS modification request procedure in the following cases:

1> if the UE has any MBMS Selected Service; and

1> if the IE "MCCH configuration information" was received in System Information Block Type 5 or System Information Block Type 5bis prior to entering CELL_DCH.

A UE completing an RRC Connection Setup procedure shall initiate the MBMS modification request procedure in the following cases:

1> if the UE has any MBMS Selected Service; and

1> if the IE "MCCH configuration information" was received in System Information Block Type 5 or System Information Block Type 5bis prior to completing the RRC Connection Setup procedure.

…

The UE shall set the contents of the MBMS MODIFICATION REQUEST message as follows:

1> if there is a change in selection of one or more of the MBMS Selected Services:

2> if the UE has not selected any MBMS Selected Service:

3> include the MBMS Selected Service Info and set the Status to 'None'.

2> otherwise:

3> include the MBMS Selected Service Info and set the Status to 'Some'.

3> for each MBMS Selected Service:

4> include the MBMS Selected Service ID.

Reference

3GPP TS 25.331 clauses 8.7.6.2, 8.7.6.2a.

#### 8.5.4.1.3 Test purpose

1. To verify that when the list of MBMS Selected Services is not empty, the UE sends the MBMS Selected Services Information to the network when entering RRC connected mode.

2. To verify that when the list of MBMS Selected Services is not empty, the UE sends the MBMS Selected Services Information to the network when entering CELL_DCH state.

8.5.4.1.4                    Method of test

Initial condition

System Simulator:

    1 MBMS cell.

User Equipment:

    The UE is interested in the selected service to be provided by the SS (included in
    MBMS_ACTIVATED_SERVICES variable).

    The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

Related ICS/IXIT statements

    -   MBMS Broadcast service application available on UE    Yes / No

Test procedure

The UE is in idle mode and has selected MBMS Service 1. The UE performs an outgoing call to setup a PS service.
After the RRC connection establishment, the UE transmits an MBMS MODIFICATION REQUEST message
containing the selected service to the SS.

Then the SS transmits a PHYSICAL CHANEL RECONFIGURATION message to move the UE to CELL_DCH state.
After entering CELL_DCH state, the UE transmits an MBMS MODIFICATION REQUEST message containing the
selected service to the SS.

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | **UE** | **SS** | | |
| 1 | → | | RRC CONNECTION REQUEST | |
| 2 | ← | | RRC CONNECTION SETUP | |
| 3 | → | | RRC CONNECTION SETUP COMPLETE | |
| 4 | → | | MBMS MODIFICATION REQUEST | This message may be received at any point after step 3 but before step 10. |
| 5 | | | VOID | |
| 6 | ← | | SECURITY MODE COMMAND | |
| 7 | → | | SECURITY MODE COMPLETE | |
| 8 | ← | | RADIO BEARER SETUP | |
| 9 | → | | RADIO BEARER SETUP COMPLETE | |
| 10 | ← | | PHYSICAL CHANNEL RECONFIGURATION | |
| 11 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE enters CELL_DCH state |
| 12 | → | | MBMS MODIFICATION REQUEST | |

Specific message contents

RRC CONNECTION SETUP (Step 2)

Use the message sub-type titled "Transition to CELL_FACH" in TS 34.108 clause 9.

MBMS MODIFICATION REQUEST (steps 4 and 12)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info<br> - CHOICE Status<br>  - MBMS Selected Services Full<br>   - MBMS Selected Service ID<br>    - MBMS Service ID<br>    - CHOICE PLMN identity<br><br>     - SameAs-MIB<br>     - explicitPLMN_Id | Some<br><br><br><br>MBMS service ID of the activated MBMS service<br>Check to see that one of the below choice element is present<br>(no data)<br>Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

RADIO BEARER SETUP (Step 8)

Use the message sub-type titled "Packet to CELL_FACH from CELL_FACH in PS" in 34.108 clause 9.PHYSICAL CHANNEL RECONFIGURATION (Step 10)

Use the message sub-type titled "Packet to CELL_DCH from CELL_FACH in PS" in 34.108 clause 9.

8.5.4.1.5 Test requirements

After step 3, the UE shall transmit an MBMS MODIFICATION REQUEST message.

After step 11, the UE shall transmit an MBMS MODIFICATION REQUEST message.

## 8.5.4.2 Modification of the MBMS Selected Services list whilst in URA_PCH & Cell_FACH / MBMS Selected Service

8.5.4.2.1 Definition

This test is applicable for Rel-6 UEs supporting MBMS broadcast services.

8.5.4.2.2 Conformance requirement

A UE in CELL_FACH, CELL_PCH or URA_PCH state shall initiate the MBMS modification request procedure in the following cases:

> 1> upon a change of the MBMS Selected Services; and

> 1> if the IE "Indicate changes in MBMS Selected Services" that is included in the MBMS GENERAL INFORMATION message is set to TRUE.

If the UE is required to initiate the MBMS modification request procedure as specified in the conditions above, the UE shall:

> 1> transmit an MBMS MODIFICATION REQUEST message with the contents as specified in subclause 8.7.6.2a.

The UE shall set the contents of the MBMS MODIFICATION REQUEST message as follows:

> 1> if the preferred frequency applicable for the MBMS service prioritised by upper layers is different from the currently used frequency:

>> 2> include the IE "MBMS preferred frequency request" and set it to the prioritised MBMS service identity.

> 1> if upper layers request to discontinue reception of an MBMS service provided via a p-t-p radio bearer:

> 2> include the p-t-p radio bearers used for the corresponding MBMS services within the IE "MBMS RB list requested to be released".

> 1> if the UE enters CELL_DCH; or

> 1> if the UE completes the RRC connection establishment procedure; or

> 1> if there is a change in selection of one or more of the MBMS Selected Services:

>> 2> if the UE has not selected any MBMS Selected Service:

>>> 3> include the MBMS Selected Service Info and set the Status to 'None'.

>> 2> otherwise:

>>> 3> include the MBMS Selected Service Info and set the Status to 'Some'.

>>> 3> for each MBMS Selected Service:

>>>> 4> include the MBMS Selected Service ID.

Reference

3GPP TS 25.331, clauses 8.7.6.2, 8.7.6.2a.

### 8.5.4.2.3 Test purpose

To verify that when a UE is in URA_PCH the introduction of a MBMS Service ID onto the MCCH does not trigger the UE to send a update to the network.

To verify that when the list of MBMS Selected Services is modified in the UE in URA_PCH or CELL_FACH, when the network indicates it should do so (in the MBMS General Information message), the UE informs the network that the MBMS selected Services have changed.

To verify that when the list of MBMS Selected Services is modified in the UE in CELL_FACH, when the network indicates it should not update the network (in the MBMS General Information message), ensure that the UE does not inform the network that the MBMS selected Services have changed.

### 8.5.4.2.4 Method of test

Initial condition

System Simulator:

> 1 MBMS cell.

User Equipment:

> The UE is in URA_PCH state as specified in clause 7.6 of TS 34.108.

> The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes / No

Test procedure

a) The MCCH on Cell 21 is modified to indicate the availability of service 1, and the Notification Indicator on MICH corresponding to service 1 is set. The IE "MBMS re-acquire MCCH" that is included in MBMS MODIFIED SERVICES INFORMATION is set to TRUE. The IE "Indicate changes in MBMS Selected Services" that is included in the MBMS GENERAL INFORMATION message is set to TRUE. The SS starts service 1 using the 64.8kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.5.

b) The SS verifies for 1 complete modification period that the UE does not perform a Cell Update or send MBMS MODIFICATION REQUEST.

c) Service 1 is removed from the UE selected services.

d) The UE performs a Cell Update, indicating "Uplink data transmission". The Cell Update Confirm message moves the UE to CELL_FACH state.

e) The UE transmits MBMS MODIFICATION REQUEST indicating the list of selected services (Status = "None").

f) Service 1 is added to the UE selected services.

g) The UE transmits MBMS MODIFICATION REQUEST indicating the list of selected services (service 1).

h) The MCCH on Cell 21 is modified, and the Notification Indicator on MICH corresponding to service 1 is set. The IE "MBMS re-acquire MCCH" that is included in MBMS MODIFIED SERVICES INFORMATION is set to TRUE. The IE "Indicate changes in MBMS Selected Services" that is included in the MBMS GENERAL INFORMATION message is set to FALSE.

i) After 1 complete modification period, service 1 is removed from the UE selected services.

j) The SS verifies for 1 complete modification period that the UE does not perform a Cell Update and/or send MBMS MODIFICATION REQUEST.

k) Service 1 is added to the UE selected services.

l) The SS verifies for 1 complete modification period that the UE does not perform a Cell Update and/or send MBMS MODIFICATION REQUEST.

Expected Sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 1 | | | | The UE state in Cell 21 is: URA_PCH<br><br>UE: Service 1 only is selected. |
| 2 | ← | | MBMS MODIFIED SERVICES INFORMATION | SS indicates the availability of the MBMS broadcast service 1.<br><br>'MBMS re- acquire MCCH' = TRUE<br><br>SS: MCCH message combination C4 for 1 modification period, then combination C2. |
| 3 | ← | | MBMS GENERAL INFORMATION | 'Indicate changes in MBMS Selected Services' = TRUE |
| 4 | | | | SS verifies for 1 complete modification period that the UE does not send MBMS MODIFICATION REQUEST. |
| 5 | | | | Service 1 is removed from the UE selected services. |
| 6 | → | | CELL UPDATE | |
| 7 | ← | | CELL UPDATE CONFIRM | The UE shall move to CELL_FACH state |
| 7a | → | | UTRAN MOBILITY INFORMATION CONFIRM | |
| 8 | → | | MBMS MODIFICATION REQUEST | MBMS Selected Service Info: Status = 'None'. |
| 9 | | | | Service 1 is added to the UE selected services. |
| 10 | → | | MBMS MODIFICATION REQUEST | MBMS Selected Service Info: Status = 'Some'. MBMS Selected Service ID = 5 |
| 11 | ← | | MBMS MODIFIED SERVICES INFORMATION | SS indicates a change in MBMS broadcast service 1.<br><br>SS: MCCH message combination C4 for 1 modification period, then combination C2. |
| 12 | ← | | MBMS GENERAL INFORMATION | 'Indicate changes in MBMS Selected Services' = FALSE |
| 13 | | | | After 1 complete modification period, the UE removes service 1 from the selected services. |
| 14 | | | | SS verifies that the UE does not send MBMS MODIFICATION REQUEST or Cell Update. |
| 15 | | | | After 1 complete modification period, the UE adds service 1 to the selected services. |
| 16 | | | | SS verifies that the UE does not send MBMS MODIFICATION REQUEST or Cell Update. |

Specific message contents

MBMS MODIFIED SERVICES INFORMATION (Step 2)

The same message found in TS 34.108 clause 9, with the following exceptions:

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | |
| - MBMS Transmission identity | |
| - MBMS Service ID | '000005' |
| - MBMS Session ID | 1 |
| - MBMS required UE action | Acquire PTM RB Info |
| - Continue MCCH reading | FALSE |
| MBMS re- acquire MCCH | TRUE |

MBMS GENERAL INFORMATION (Step 3)

The same message found in TS 34.108 clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| Indicate changes in MBMS Selected Services | TRUE |

CELL UPDATE (Step 6)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| Cell Update Cause | Check to see if set to 'uplink data transmission' |

CELL UPDATE CONFIRM (Step 7)

| Information Element | Value/remark |
|---|---|
| New C-RNTI | '1010 1010 1010 1010' |

MBMS MODIFICATION REQUEST (STEP 8)

| Information Element | Value/remark |
|---|---|
| MBMS Selected Service Info<br> - CHOICE Status | None |

MBMS MODIFICATION REQUEST (STEP 10)

| Information Element | Value/remark |
|---|---|
| MBMS Selected Service Info<br> - CHOICE Status<br>   - MBMS Selected Services<br>     - MBMS Selected Service ID<br>     - CHOICE PLMN identity<br><br>     - SameAs-MIB<br>     - explicitPLMN_Id | Some<br><br>'000005'<br>Check to see that one of the below choice element is present<br>(no data)<br>Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

MBMS MODIFIED SERVICES INFORMATION (Step 11)

The same message found in TS 34.108 clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| Modified service list<br> - MBMS Transmission identity<br>   - MBMS Service ID<br>   - MBMS Session ID<br> - MBMS required UE action<br> - Continue MCCH reading | <br><br>'000005'<br>1<br>None<br>FALSE |
| MBMS re-acquire MCCH | TRUE |

MBMS GENERAL INFORMATION (Step 12)

The same message found in TS 34.108 clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| Indicate changes in MBMS Selected Services | FALSE |

8.5.4.2.5 Test requirements

In steps b, j, and l the UE shall not send MBMS MODIFICATION REQUEST.

In step e the UE shall transmit MBMS GENERAL INFORMATION indicating the list of selected services (Status = "None").

In step g the UE shall transmit MBMS GENERAL INFORMATION indicating the list of selected services (Status = "Some", MBMS Selected Service ID = '000005').

## 8.5.4.3 Testing of the MBMS Selected Services indication from the network whilst in CELL_DCH / MBMS Selected Service

8.5.4.3.1 Definition

This test is applicable for Rel-6 UEs supporting MBMS broadcast services and MBMS p-t-m reception in CELL_DCH state.

8.5.4.3.2 Conformance requirement

A UE in CELL_DCH shall initiate the MBMS modification request procedure in the following cases:

1> the preferred frequency applicable for the MBMS service prioritised by upper layers is different from the currently used frequency;

1> upper layers request to discontinue reception of an MBMS service provided via a p-t-p radio bearer e.g. because this inhibits reception of a higher priority service;

1> upon a change in selection of the MBMS Selected Services.

NOTE: The above case may occur upon receiving a dedicated notification or in other cases e.g. a change of transfer mode from p-t-p to p-t-m for the UE's highest priority MBMS service.

...

If the UE is required to initiate the MBMS modification request procedure as specified in the conditions above, the UE shall:

1> transmit an MBMS MODIFICATION REQUEST message with the contents as specified in subclause 8.7.6.2a.

The UE shall set the contents of the MBMS MODIFICATION REQUEST message as follows:

1> if the preferred frequency applicable for the MBMS service prioritised by upper layers is different from the currently used frequency:

2> include the IE "MBMS preferred frequency request" and set it to the prioritised MBMS service identity.

1> if upper layers request to discontinue reception of an MBMS service provided via a p-t-p radio bearer:

2> include the p-t-p radio bearers used for the corresponding MBMS services within the IE "MBMS RB list requested to be released".

1> if the UE enters CELL_DCH; or

1> if the UE completes the RRC connection establishment procedure; or

1> if there is a change in selection of one or more of the MBMS Selected Services:

2> if the UE has not selected any MBMS Selected Service:

3> include the MBMS Selected Service Info and set the Status to 'None'.

2> otherwise:

3> include the MBMS Selected Service Info and set the Status to 'Some'.

3> for each MBMS Selected Service:

4> include the MBMS Selected Service ID.

Reference

3GPP TS 25.331, clauses 8.7.6.2, 8.7.6.2a.

### 8.5.4.3.3 Test purpose

To verify that the UE updates the MBMS Selected Service Information at the introduction of a MBMS Service ID on the MCCH, when the UE is in CELL_DCH state.

### 8.5.4.3.4 Method of test

Initial condition

System Simulator:

- 1 MBMS cell.

User Equipment:

- The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

- The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE     Yes/No

- UE supports MBMS MCCH reception in CELL_DCH state Yes/No

Test procedure

a) The MCCH on Cell 21 is modified to indicate the availability of service 1, and the Notification Indicator on MICH corresponding to service 1 is set. The IE "MBMS re- acquire MCCH" that is included in MBMS MODIFIED SERVICES INFORMATION is set to TRUE. The SS starts service 1 using the 64.8kbps radio bearer configuration as specified in TS 34.108 clause 6.10.2.4.3.5.

b) The SS verifies for 1 complete modification period that the UE does not send MBMS MODIFICATION REQUEST.

c) Service 1 is removed from the UE selected services.

d) The UE transmits MBMS MODIFICATION REQUEST indicating the list of selected services (Status = "None").

e) Service 1 is added to the UE selected services.

f) The UE transmits MBMS MODIFICATION REQUEST indicating the list of selected services (service 1).

Expected Sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE state in Cell 21 is: CELL_DCH<br><br>UE: Service 1 only is selected. |
| 2 | ← | | MBMS MODIFIED SERVICES INFORMATION | SS indicates the availability of the MBMS broadcast service 1.<br><br>'MBMS re-acquire MCCH' = TRUE<br><br>SS: MCCH message combination C4 for 1 modification period, then combination C2. |
| 3 | | | | SS verifies for 1 complete modification period that the UE does not send MBMS MODIFICATION REQUEST. |
| 4 | | | | Service 1 is removed from the UE selected services. |
| 5 | → | | MBMS MODIFICATION REQUEST | MBMS Selected Service Info: Status = 'None'. |
| 6 | | | | Service 1 is added to the UE selected services. |
| 7 | → | | MBMS MODIFICATION REQUEST | MBMS Selected Service Info: Status = 'Some'. MBMS Selected Service ID = 5 |

Specific message contents

MBMS MODIFIED SERVICES INFORMATION (Step 2)

The same message found in TS 34.108 clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| Modified service list | |
|   - MBMS Transmission identity | |
|     - MBMS Service ID | '000005' |
|     - MBMS Session ID | 1 |
|   - MBMS required UE action | Acquire PTM RB Info |
|   - Continue MCCH reading | FALSE |
| MBMS re-acquire MCCH | TRUE |

MBMS MODIFICATION REQUEST (STEP 5)

| Information Element | Value/remark |
|---|---|
| MBMS Selected Service Info | |
|   - CHOICE Status | None |

MBMS MODIFICATION REQUEST (STEP 7)

| Information Element | Value/remark |
|---|---|
| MBMS Selected Service Info | |
|   - CHOICE Status | Some |
|     - MBMS Selected Services Full | |
|       - MBMS Selected Service ID | |
|         - MBMS Service ID | '000005' |
|         - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|       - SameAs-MIB | (no data) |
|       - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

8.5.4.3.5 Test requirements

In step 3 the UE shall not send MBMS MODIFICATION REQUEST.

In step 5 the UE shall transmit MBMS MODIFICATION REQUEST indicating the list of selected services (Status = "None").

In step 7 the UE shall transmit MBMS MODIFICATION REQUEST indicating the list of selected services (Status = "Some", MBMS Service ID = '000005').

# 8.5.5 MBMS Counting

## 8.5.5.1 MBMS Counting in Idle Mode / MBMS Selected Service

### 8.5.5.1.1 Definition

This test case is applicable for all UEs supporting MBMS broadcast services.

### 8.5.5.1.2 Conformance requirement

The MBMS counting procedure is used by the UE to inform UTRAN about its interest to receive an MBMS transmission.

…

The UE initiates the MBMS counting procedure for an MBMS transmission upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" with the value set to 'Acquire counting info' or set to "Acquire counting info– PTM RBs unmodified".

…

Upon receiving the MBMS ACCESS INFORMATION message including one or more MBMS service(s) it has joined, and/ or including one or more MBMS Selected Services the UE shall for each joined and / or selected service:

1> if the UE is in idle mode:

    2> draw a random number, "rand", uniformly distributed in the range: $0 \leq$ rand $< 1$

    2> if 'rand' is lower than the value indicated by the IE 'Access probability factor-Idle' for the concerned service:

        3> indicate to upper layers that establishment of an RRC connection is required to receive the concerned MBMS service, with the establishment cause set to 'MBMS reception';

        3> if the above condition applies for more than one service, initiate a single indication to upper layers;

        3> if the RRC connection establishment succeeds, the procedure ends.

…

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

  …

  1> otherwise if the UE performs connection establishment for MBMS counting as specified in subclause 8.7.4; and

  1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

    2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

        3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

        3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> if the UE included one or more "MBMS Selected Service ID" IEs:

2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

Reference

3GPP TS 25.331 clauses 8.7.4, 8.7.4.1, 8.7.4.2, 8.7.4.3, 8.1.3.3.

### 8.5.5.1.3 Test purpose

To confirm that the UE starts the MBMS counting procedure in idle mode upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" and an ACCESS INFORMATION message including IE "Access probability factor – Idle" set to 0 (corresponding to the actual probability factor value 1).

To verify that the UE correctly includes the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and IE "MBMS Modification Period identity" in the counting response initiated for a MBMS Selected Service.

### 8.5.5.1.4 Method of test

Initial Condition

System Simulator: 1 MBMS cell (cell 21) using MCCH Longest Default scheduling, and combination C1 as defined in TS 34.108 clause 11.

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE Yes/No.

Test Procedure

The SS transmits an MBMS MODIFIED SERVICE INFORMATION message which includes in the "Modified service list" for the MBMS activated service "MBMS required UE action" set to "Acquire counting info".

The SS transmits an MBMS ACCESS INFORMATION message, which includes the MBMS Short transmission ID associated to the MBMS activated service and "Access probability factor – Idle" set to 0.

NOTE: The "Access probability factor" sent in the MBMS ACCESS INFORMATION message set to 0 corresponds to an actual Probability Factor = 1, according to the formula in TS 25.331 clause 10.2.16e.

The UE transmits an RRC CONNECTION REQUEST message to the SS, with "Establishment cause" set to "MBMS reception".

The SS transmits an RRC CONNECTION SETUP message to the UE which moves the UE to CELL_DCH state.

When the UE receives this message, the UE establishes an RRC connection and transmits an RRC CONNECTION SETUP COMPLETE message.

Expected sequence

| Step | Direction | | Message | Comment |
|------|------|------|---------|---------|
| | **UE** | **SS** | | |
| | | | | The UE is in idle mode. |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | The SS transmits the message, which includes "MBMS required UE action" set to "Acquire counting info" |
| 2 | ← | | MBMS ACCESS INFORMATION | The SS transmits the message, which includes "MBMS short transmission ID" IE referring to the service the UE has activated and "Access probability factor – Idle" IE set to 0 (corresponding to actual Access Probability = 1). |
| 3 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS reception" and with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 4 | ← | | RRC CONNECTION SETUP | SS assigns DPCH resources to allow UE to establish an RRC connection. RRC state indicator set to CELL_DCH. |
| 5 | → | | RRC CONNECTION SETUP COMPLETE | |
| 5a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC Connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 5 and before step 7. |
| 6 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 7 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire counting info |

MBMS ACCESS INFORMATION (Step 2)

| Information Element | Value/remark |
|---|---|
| Service list | Only 1 entry |
| - MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| - Access probability factor – Idle | 0 (corresponding to the actual probability factor value 1) |
| - Connected mode counting scope | |
|    - URA_PCH | FALSE |
|    - CELL_PCH | FALSE |
|    - CELL_FACH | FALSE |

RRC CONNECTION REQUEST (Step 3)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI. |
| Establishment Cause | MBMS reception |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

MBMS MODIFICATION REQUEST (steps 5a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
|  - CHOICE Status | Some |
|   - MBMS Selected Services Full | |
|    - MBMS Selected Service ID | Only 1 entry |
|     - MBMS Service ID | MBMS service ID of the activated MBMS service |
|     - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|      - SameAs-MIB | (no data) |
|      - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

### 8.5.5.1.5 Test requirement

At step 3, the UE shall transmit an RRC CONNECTION REQUEST message with "Establishment Cause" set to "MBMS reception" on the uplink CCCH and including in case of MBMS Selected services the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

At step 5, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message on a dedicated channel.

## 8.5.5.1m MBMS Counting in Idle Mode / MBMS Multicast Service

### 8.5.5.1m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.5.1m.2 Conformance requirement

Same conformance requirement as in clause 8.5.5.1.2 except there is no reference to 3GPP TS 25.331 clause 8.1.3.3.

Reference

3GPP TS 25.331 clauses 8.7.4, 8.7.4.1, 8.7.4.2, 8.7.4.3.

8.5.5.1m.3          Test purpose

To confirm that the UE starts the MBMS counting procedure in idle mode upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" and an ACCESS INFORMATION message including IE "Access probability factor – Idle" set to 0 (corresponding to the actual probability factor value 1).

8.5.5.1m.4          Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 22

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE          Yes/No.

Test procedure

Same test procedure as in clause 8.5.5.1.4.

Expected sequence

Same expected sequence as in clause 8.5.5.1.4 except for RRC CONNECTION REQUEST message content (step 3) and MODIFICATION REQUEST procedure not required.

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| | | | | The UE is in idle mode. |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | The SS transmits the message, which includes "MBMS required UE action" set to "Acquire counting info" |
| 2 | | ← | MBMS ACCESS INFORMATION | The SS transmits the message, which includes "MBMS short transmission ID" IE referring to the service the UE has joined and "Access probability factor – Idle" IE set to 0 (corresponding to actual Access Probability = 1). |
| 3 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS reception" |
| 4 | | ← | RRC CONNECTION SETUP | SS assigns DPCH resources to allow UE to establish an RRC connection. RRC state indicator set to CELL_DCH. |
| 5 | → | | RRC CONNECTION SETUP COMPLETE | |
| 6 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Multicast service Reception". |
| 7 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.5.1.4 except for RRC CONNECTION REQUEST message content (step 3).

RRC CONNECTION REQUEST (Step 3)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI. |
| Establishment Cause | MBMS reception |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | Not present |

8.5.5.1m.5 Test requirements

At step 3, the UE shall transmit an RRC CONNECTION REQUEST message with "Establishment Cause" set to "MBMS reception" on the uplink CCCH.

At step 5, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message on a dedicated channel.

## 8.5.5.2 MBMS Counting in CELL_FACH / MBMS Selected Service

### 8.5.5.2.1 Definition

This test case is applicable for UEs that support MBMS broadcast services.

### 8.5.5.2.2 Conformance requirement

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

1> if the IE "MBMS required UE action" is set to 'Acquire counting info' or set to 'Acquire counting info– PTM RBs unmodified':

2> perform the MBMS counting procedure as specified in subclause 8.7.4;

NOTE:    If upper layers indicate that an MBMS transmission has already been received correctly, the UE will continue as if the information about the concerned MBMS transmission was not included in the message. This implies that the UE does not respond to counting for a transmission already received correctly.

…

The MBMS counting procedure is used by the UE to inform UTRAN about its interest to receive an MBMS transmission. The procedure applies to UEs supporting MBMS that are in idle mode or in connected mode. In connected mode the procedure applies to the URA_PCH, Cell_PCH and/ or Cell_FACH states dependent upon the value of the IE "Connected mode counting scope".

…

The UE initiates the MBMS counting procedure for an MBMS transmission upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" with the value set to 'Acquire counting info' or set to "Acquire counting info– PTM RBs unmodified".

…

Upon receiving the MBMS ACCESS INFORMATION message including one or more MBMS service(s) it has joined, and/ or including one or more MBMS Selected Services the UE shall for each joined and / or selected service:

…

1> if the UE is in URA_PCH state, Cell_PCH or Cell_FACH state and the IE "Connected mode counting scope" indicates that counting is applicable for this UE state:

> 2> draw a random number, "rand", uniformly distributed in the range: $0 \leq rand < 1$.

> 2> if 'rand' is lower than the value indicated by the IE 'Access probability factor-connected' for the concerned service:

>> 3> if a cell update has not been successfully transmitted for this service in the current modification period:

>>> 4> initiate the cell update procedure with 'Cell update cause' set to "MBMS reception", in accordance with subclause 8.3.1;

>>> 4> if the above condition applies for more than one service, initiate a single cell update;

>>> 4> if the cell update procedure succeeds,

>>>> 5> the procedure ends.

> 2> otherwise:

>> 3> if the message triggering the MBMS counting procedure included the IE "Continue MCCH reading" with a value set to TRUE:

>>> 4> continue acquiring further MBMS ACCESS INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

>> 3> otherwise:

>>> 4> continue acquiring further MBMS ACCESS INFORMATION messages without delaying reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

> 1> otherwise:

>> 2> the procedure ends;

Upon receiving the MBMS ACCESS INFORMATION message not including an MBMS service(s) the UE has joined:

> 1> the procedure ends;

…

The UE shall set the IEs in the CELL UPDATE message as follows:

…

> 1> otherwise, if the UE performs cell update for MBMS counting as specified in subclause 8.7.4; and

> 1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

>> 2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

>>> 3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

>>> 3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

> 1> if the UE included one or more "MBMS Selected Service ID" IEs:

>> 2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

Reference

3GPP TS 25.331 clauses 8.6.9.6, 8.7.4, 8.7.4.1, 8.7.4.2, 8.7.4.3, 8.3.1.3.

8.5.5.2.3          Test purpose

To verify that the UE correctly handles the counting procedure in cell_FACH state, upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" and an ACCESS INFORMATION message including IE "Access probability factor – Connected" set to 0.

To verify that the UE correctly includes the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and IE "MBMS Modification Period identity" in the counting response initiated for a MBMS Selected Service.

8.5.5.2.4          Method of test

Initial condition

System Simulator: one MBMS cell (cell 21) using MCCH Shortest Default scheduling, and combination C1 as defined in TS 34.108 clause 11.

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE     Yes/No.

Test procedure

1)  The SS sends a MBMS MODIFIED SERVICES INFORMATION message which includes the IE "MBMS required UE action" set to 'Acquire counting info' for the MBMS Service identity in the MBMS Transmission identity matching the one in the MBMS_ACTIVATED_SERVICES variable.

2)  The SS sends in the same Modification Period the MBMS ACCESS INFORMATION message which includes:

    - the "MBMS short transmission ID" IE referring to the service the UE has activated

    - the "Connected mode counting scope" IE set to TRUE applicable to the UE connected state and

    - the value for "Access probability factor – connected" IE set to 0 (corresponding to the actual probability factor value 1)

3)  The UE shall perform the MBMS counting procedure. The UE shall draw a random number 'rand'. If 'rand' is lower than the value indicated by the IE "Access probability factor – connected", it shall send a CELL UPDATE message to the SS on the uplink CCCH of cell 21 and set IE "Cell update cause" to "MBMS reception". The IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity" shall be included in the counting response initiated for a MBMS Selected Service. After the SS receives this message, it transmits a CELL UPDATE CONFIRM message to the UE on the downlink CCCH.

4)  The SS sends the MBMS ACCESS INFORMATION message again in the same Modification Period. The UE shall not perform the MBMS counting procedure during the same Modification Period.

Expected sequence

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |
| 2 | | ← | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE referring to the service the UE has activated, "Connected mode counting scope" IE set to "TRUE", "Access probability factor – connected" IE set to 0. |

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 3 | → | | CELL UPDATE | The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS reception" and in case of MBMS Selected service the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 4 | ← | | CELL UPDATE CONFIRM | |
| 5 | ← | | MBMS ACCESS INFORMATION | The SS sends again in the same MP a MBMS access Information message. |
| 6 | | | | The SS check that the UE shall not perform again the counting procedure by sending another cell update message. |
| 7 | ←→ | | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9.1.1 with the following exceptions:

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified services list | Only 1 entry |
| -MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| -MBMS required UE action | Acquire counting info |

MBMS Access Information (Steps 2 and 5)

| Information Element | Value/remark |
|---------------------|--------------|
| Service list | Only 1 entry |
| -MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| -Access probability factor – connected | 0 (corresponding to the actual probability factor value 1) |
| -Connected mode counting scope | |
|   - URA_PCH | FALSE |
|   - CELL_PCH | FALSE |
|   - CELL_FACH | TRUE |

CELL UPDATE (Step 3)

| Information Element | Value/remark |
|---------------------|--------------|
| Cell update cause | MBMS reception |
| MBMS Selected Services | present in case of MBMS Selected service |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

8.5.5.2.5 Test requirements

At step 3, check that the UE performs the MBMS counting procedure by performing the cell update procedure using the cause value "MBMS reception" and using in case of MBMS Selected services the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

At step 6, check that the UE does not perform the MBMS counting again during the same Modification Period.

## 8.5.5.2m MBMS Counting in CELL_FACH / MBMS Multicast Service

### 8.5.5.2m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.5.2m.2 Conformance requirement

Same conformance requirement as in clause 8.5.5.2.2 except there is no reference to 3GPP TS 25.331 clause 8.3.1.3.

### 8.5.5.2m.3 Test purpose

To verify that the UE correctly handles the counting procedure in cell_FACH state, upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" and an ACCESS INFORMATION message including IE "Access probability factor – Connected" set to 0.

### 8.5.5.2m.4 Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 22

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE Yes/No.

Test procedure

Same test procedure as in clause 8.5.5.2.4 except for the points 2 and 3:

2) The SS sends in the same Modification Period the MBMS ACCESS INFORMATION message which includes:

- the "MBMS short transmission ID" IE referring to the service the UE has joined

- the "Connected mode counting scope" IE set to TRUE applicable to the UE connected state and

- the value for "Access probability factor – connected" IE set to 0 (corresponding to the actual probability factor value 1)

3) The UE shall perform the MBMS counting procedure. The UE shall draw a random number 'rand'. If 'rand' is lower than the value indicated by the IE "Access probability factor – connected", it shall send a CELL UPDATE message to the SS on the uplink CCCH of cell 21 and set IE "Cell update cause" to "MBMS reception". After the SS receives this message, it transmits a CELL UPDATE CONFIRM message to the UE on the downlink CCCH.

Expected sequence

Same expected sequence as in clause 8.5.5.2.4 except for CELL UPDATE message content (step 3).

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |
| 2 | | ← | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE referring to the service the UE has joined, "Connected mode counting scope" IE set to "TRUE", "Access probability factor – connected" IE set to 0. |
| 3 | → | | CELL UPDATE | The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS reception". |
| 4 | | ← | CELL UPDATE CONFIRM | |
| 5 | | ← | MBMS ACCESS INFORMATION | The SS sends again in the same MP a MBMS access Information message. |
| 6 | | | | The SS check that the UE shall not perform again the counting procedure by sending another cell update message. |
| 7 | ←→ | | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.5.2.4 except for CELL UPDATE message content (step 3).

CELL UPDATE (Step 3)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---------------------|--------------|
| Cell update cause | MBMS reception |

8.5.5.2m.5 Test requirements

At step 3, check that the UE performs the MBMS counting procedure by performing the cell update procedure using the cause value "MBMS reception".

At step 6, check that the UE does not perform the MBMS counting again during the same Modification Period.

## 8.5.5.3 MBMS No Counting in CELL_DCH / MBMS Selected Service

### 8.5.5.3.1 Definition

This test is applicable for all UEs that support MBMS broadcast services and capable of reading MCCH in CELL_DCH state.

### 8.5.5.3.2 Conformance requirement

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

1> if the "MBMS required UE action" is set to 'None':

2> take no action with respect to this IE.

1> if the IE "MBMS required UE action" is set to 'Acquire counting info' or set to 'Acquire counting info – PTM RBs unmodified':

2> perform the MBMS counting procedure as specified in subclause 8.7.4;

NOTE: If upper layers indicate that an MBMS transmission has already been received correctly, the UE will continue as if the information about the concerned MBMS transmission was not included in the message. This implies that the UE does not respond to counting for a transmission already received correctly.

…

The MBMS counting procedure is used by the UE to inform UTRAN about its interest to receive an MBMS transmission. The procedure applies to UEs supporting MBMS that are in idle mode or in connected mode. In connected mode the procedure applies to the URA_PCH, Cell_PCH and/ or Cell_FACH states dependent upon the value of the IE "Connected mode counting scope".

The UE initiates the MBMS counting procedure for an MBMS transmission upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" with the value set to 'Acquire counting info' or set to "Acquire counting info– PTM RBs unmodified".

The UE shall acquire the MBMS ACCESS INFORMATION message without delaying reading of MCCH until the next modification period in accordance with subclause 8.7.1.3. If the procedure the UE would apply to respond to counting (Idle mode: RRC connection establishment, connected mode: Cell update) is ongoing, the UE may defer acquiring the MBMS ACCESS INFORMATION message until this procedure has completed.

The UE behaviour upon receiving an MBMS ACCESS INFORMATION message that is contained in more than one TTI is not specified.

Upon receiving the MBMS ACCESS INFORMATION message including one or more MBMS service(s) it has joined, and/or including one or more MBMS Selected Services the UE shall for each joined and/or selected service:

1> if the UE is in idle mode:

…

1> if the UE is in URA_PCH state, Cell_PCH or Cell_FACH state and the IE "Connected mode counting scope" indicates that counting is applicable for this UE state:

…

1> otherwise:

2> the procedure ends;

Reference

3GPP TS 25.331 clauses 8.6.9.6, 8.7.4.1, 8.7.4.2, 8.7.4.3.

### 8.5.5.3.3 Test purpose

To verify that the UE in CELL_DCH state (with the probability factor set to 1) does not perform the MBMS counting procedure.

### 8.5.5.3.4 Method of test

Initial condition

System Simulator: one MBMS cell (cell 21) using MCCH Default 2 scheduling, and combination C1 as defined in TS 34.108 clause 11.

User Equipment:

The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108. The UE has been registered in both CS and PS domains.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE Yes/No.

- UE supports MCCH reception in CELL_DCH state        Yes/No.

Test procedure

The UE is in CELL_DCH state. The SS transmits an MBMS MODIFIED SERVICES INFORMATION message which includes the IE "MBMS required UE action" set to "Acquire counting info" for the MBMS Service identity in the MBMS Transmission identity matching the one in the MBMS_ACTIVATED_SERVICES variable.

The UE receives an MBMS ACCESS INFORMATION message including the concerned MBMS Selected service.

The UE shall not perform the MBMS counting procedure.

The SS continues to send MBMS ACCESS INFORMATION messages including the MBMS Selected service in the same Modification Period. The UE shall not perform the MBMS counting procedure.

The UE receives an MBMS ACCESS INFORMATION message including the MBMS Selected service in the next Modification Period. The UE shall not perform the MBMS counting procedure.

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
|      | UE  | SS  |         |          |
|      |     |     |         | The UE is in CELL_DCH state. |
| 1    |     | ←   | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |
| 2    |     | ←   | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE referring to the service the UE has activated, "Connected mode counting scope" IE set to "TRUE", "Access probability factor – connected" IE " set to 0 (corresponding to the actual probability factor value 1). |
| 3    |     |     |         | The SS checks that the UE does not perform the counting procedure. |
| 4    |     | ←   | MBMS ACCESS INFORMATION | The SS continues to send MBMS access Information messages in the same MP. |
| 5    |     |     |         | The SS checks that the UE does not perform the counting procedure. |
| 6    |     | ←   | MBMS ACCESS INFORMATION | The SS sends a MBMS access Information message in the next MP. |
| 7    |     |     |         | The SS checks that the UE does not perform the counting procedure. |
| 8    | ←→  |     | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire counting info |
| - Continue MCCH reading | TRUE |

MBMS ACCESS INFORMATION (Step 2, Step 4 and Step 6)

| Information Element | Value/remark |
|---|---|
| Service list | Only 1 entry |
| - MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| - Access probability factor - Idle | 0 (corresponding to the actual probability factor value 1) |
| - Connected mode counting scope | |
|    - URA_PCH | TRUE |
|    - CELL_PCH | TRUE |
|    - CELL_FACH | TRUE |

### 8.5.5.3.5 Test requirements

After step 2, the UE shall not perform the MBMS counting procedure.

After step 4, the UE shall not perform the MBMS counting procedure.

After step 6, the UE shall not perform the MBMS counting procedure.

## 8.5.5.3m MBMS No Counting in CELL_DCH / MBMS Multicast Service

### 8.5.5.3m.1 Definition

This test is applicable for all UEs that support MBMS multicast services and capable of reading MCCH in CELL_DCH state.

### 8.5.5.3m.2 Conformance requirement

Same conformance requirement as in clause 8.5.5.3.2.

### 8.5.5.3m.3 Test purpose

Same test purpose as in clause 8.5.5.3.3.

### 8.5.5.3m.4 Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 22

User Equipment:

The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE    Yes/No.

- UE supports MCCH reception in CELL_DCH state    Yes/No.

Test procedure

    The UE is in CELL_DCH state. The SS transmits an MBMS MODIFIED SERVICES INFORMATION message which includes the IE "MBMS required UE action" set to "Acquire counting info" for the MBMS Service identity in the MBMS Transmission identity matching the one in the MBMS_ACTIVATED_SERVICES variable.

    The UE receives an MBMS ACCESS INFORMATION message including the MBMS service the UE has joined.

    The UE shall not perform the MBMS counting procedure.

The SS continues to send MBMS ACCESS INFORMATION messages including the MBMS service the UE has joined in the same Modification Period. The UE shall not perform the MBMS counting procedure.

The UE receives an MBMS ACCESS INFORMATION message including the MBMS service the UE has joined in the next Modification Period. The UE shall not perform the MBMS counting procedure.

Expected sequence

Same expected sequence as in clause 8.5.5.3.4 except for MBMS ACCESS INFORMATION message contents (steps 2, 4 and 6).

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| | | | | The UE is in CELL_DCH state. |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |
| 2 | | ← | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE referring to the service the UE has joined. |
| 3 | | | | The SS checks that the UE does not perform the counting procedure. |
| 4 | | ← | MBMS ACCESS INFORMATION | The SS continues to send MBMS access Information messages in the same MP. |
| 5 | | | | The SS checks that the UE does not perform the counting procedure. |
| 6 | | ← | MBMS ACCESS INFORMATION | The SS sends a MBMS access Information message in the next MP. |
| 7 | | | | The SS checks that the UE does not perform the counting procedure. |
| 8 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.5.3.4.

### 8.5.5.3m.5 Test requirements

Same test requirement as in clause 8.5.5.3.5.

## 8.5.5.4 MBMS Counting in CELL_PCH / MBMS Selected Service

### 8.5.5.4.1 Definition

This test case is applicable for UEs that support MBMS broadcast services.

### 8.5.5.4.2 Conformance requirement

The MBMS counting procedure is used by the UE to inform UTRAN about its interest to receive an MBMS transmission. The procedure applies to UEs supporting MBMS that are in idle mode or in connected mode. In connected mode the procedure applies to the URA_PCH, Cell_PCH and/or Cell_FACH states dependent upon the value of the IE "Connected mode counting scope".

…

The UE initiates the MBMS counting procedure for an MBMS transmission upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" with the value set to 'Acquire counting info' or set to "Acquire counting info – PTM RBs unmodified".

…

Upon receiving the MBMS ACCESS INFORMATION message including one or more MBMS service(s) it has joined, and/or including one or more MBMS Selected Services the UE shall for each joined and/or selected service:

...

1> if the UE is in URA_PCH state, Cell_PCH or Cell_FACH state and the IE "Connected mode counting scope" indicates that counting is applicable for this UE state:

2> draw a random number, "rand", uniformly distributed in the range: $0 \leq rand < 1$.

2> if 'rand' is lower than the value indicated by the IE 'Access probability factor-connected' for the concerned service:

3> if a cell update has not been successfully transmitted for this service in the current modification period:

4> initiate the cell update procedure with 'Cell update cause' set to "MBMS reception", in accordance with subclause 8.3.1;

4> if the above condition applies for more than one service, initiate a single cell update;

4> if the cell update procedure succeeds,

5> the procedure ends.

2> otherwise:

3> if the message triggering the MBMS counting procedure included the IE "Continue MCCH reading" with a value set to TRUE:

4> continue acquiring further MBMS ACCESS INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

3> otherwise:

4> continue acquiring further MBMS ACCESS INFORMATION messages without delaying reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

1> otherwise:

2> the procedure ends;

Upon receiving the MBMS ACCESS INFORMATION message not including an MBMS service(s) the UE has joined:

1> the procedure ends;

...

The UE shall set the IEs in the CELL UPDATE message as follows:

...

1> otherwise, if the UE performs cell update for MBMS counting as specified in subclause 8.7.4; and

1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

3> order the MBMS Selected Services such that those selected with a higher priority are listed in the IE "MBMS Selected Services Short" before those selected with a lower priority;

3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

1> if the UE included one or more "MBMS Selected Service ID" IEs:

2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

Reference

3GPP TS 25.331 clauses 8.7.4, 8.7.4.1, 8.7.4.2, 8.7.4.3, 8.3.1.3.

### 8.5.5.4.3 Test purpose

To verify that the UE correctly handles the counting procedure in cell_PCH state, upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" and an ACCESS INFORMATION message including IE "Access probability factor – Connected" set to 0 for the selected services.

To verify that the UE correctly includes the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and IE "MBMS Modification Period identity" in the counting response initiated for a MBMS Selected Service.

### 8.5.5.4.4 Method of test

Initial condition

System Simulator: one MBMS cell (cell 21)

User Equipment:

The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE Yes/No.

Test procedure

1) The SS sends a MBMS MODIFIED SERVICES INFORMATION message which includes the IE "MBMS required UE action" set to 'Acquire counting info' for the MBMS Service identity in the MBMS Transmission identity matching the one in the MBMS_ACTIVATED_SERVICES variable.

2) The SS sends in the same Modification Period the MBMS ACCESS INFORMATION message which includes:

   - the "MBMS short transmission ID" IE referring to the service the UE has activated

   - the "Connected mode counting scope" IE set to TRUE applicable to the UE connected state and

   - the value for "Access probability factor – connected" IE set to 0 (corresponding to the actual probability factor value 1)

3) The UE shall perform the MBMS counting procedure. The UE shall draw a random number 'rand'. If 'rand' is lower than the value indicated by the IE "Access probability factor – connected", it shall send a CELL UPDATE message to the SS on the uplink CCCH of cell 21 and set IE "Cell update cause" to "MBMS reception". The IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity" shall be included in the counting response initiated for the MBMS Selected Service. After the SS receives this message, it transmits a CELL UPDATE CONFIRM message to the UE on the downlink CCCH. The UE shall move to the Cell_PCH state as indicated by the IE "RRC State Indicator".

4) The SS sends the MBMS ACCESS INFORMATION message again in the same Modification Period. The UE shall not perform the MBMS counting procedure during the same Modification Period.

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----------|-----|---------|----------|
| | UE | SS | | |
| | | | | The UE is in cell_PCH |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |

| Step | Direction | | Message | Comments |
|------|-----------|-----|---------|----------|
| | UE | SS | | |
| 2 | ← | | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE referring to the service the UE has activated and "Connected mode counting scope" IE set to "TRUE", "Access probability factor – connected" IE set to 0. |
| 3 | → | | CELL UPDATE | The UE shall perform the MBMS counting procedure which triggers the cell updating procedure which moves the UE into CELL_FACH state. The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS reception" and the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 4 | ← | | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to CELL_PCH. |
| 5 | ← | | MBMS ACCESS INFORMATION | The SS sends again in the same MP a MBMS access Information message. |
| 6 | | | | The SS check that the UE shall not perform again the counting procedure by sending another cell update message. |
| 7 | ←→ | | CALL C.4 | If the test result of C.4 indicates that UE is in CELL_PCH state, the test passes, otherwise it fails. |

Specific message contents

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified services list | Only 1 entry |
| -MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| -MBMS required UE action | Acquire counting info |

MBMS ACCESS INFORMATION (Steps 2 and 5)

| Information Element | Value/remark |
|---------------------|--------------|
| Service list | Only 1 entry |
| -MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| -Access probability factor – connected | 0 (corresponding to the actual probability factor value 1) |
| -Connected mode counting scope | |
| - URA_PCH | TRUE |
| - CELL_PCH | TRUE |
| - CELL_FACH | TRUE |

CELL UPDATE (Step 3)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| Cell update cause | MBMS reception |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

CELL UPDATE CONFIRM (Step 4)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| RRC State Indicator | Cell_PCH |
| UTRAN DRX cycle length coefficient | 7 |

8.5.5.4.5 Test requirements

At step 3, check that the UE performs the MBMS counting procedure by performing the cell update procedure using the cause value "MBMS reception" and using in case of MBMS Selected services the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

At step 6, check that the UE does not perform the MBMS counting again during the same Modification Period.

## 8.5.5.4m MBMS Counting in CELL_PCH / MBMS Multicast Service

### 8.5.5.4m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.5.4m.2 Conformance requirement

Same conformance requirement as in clause 8.5.5.4.2 except there is no reference to 3GPP TS 25.331 clause 8.3.1.3.

### 8.5.5.4m.3 Test purpose

To verify that the UE correctly handles the counting procedure in cell_PCH state, upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" and an ACCESS INFORMATION message including IE "Access probability factor – Connected" set to 0.

### 8.5.5.4m.4 Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 22

User Equipment:

The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE      Yes/No.

Test procedure

Same test procedure as in clause 8.5.5.2.4 except for the points 2 and 3:

2) The SS sends in the same Modification Period the MBMS ACCESS INFORMATION message which includes:

- the "MBMS short transmission ID" IE referring to the service the UE has joined

- the "Connected mode counting scope" IE set to TRUE applicable to the UE connected state and

- the value for "Access probability factor – connected" IE set to 0 (corresponding to the actual probability factor value 1)

3) The UE shall perform the MBMS counting procedure. The UE shall draw a random number 'rand'. If 'rand' is lower than the value indicated by the IE "Access probability factor – connected", it shall send a CELL UPDATE message to the SS on the uplink CCCH of cell 21 and set IE "Cell update cause" to "MBMS reception". After the SS receives this message, it transmits a CELL UPDATE CONFIRM message to the UE on the downlink CCCH. The UE shall move to the Cell_PCH state as indicated by the IE "RRC State Indicator".

Expected sequence

Same expected sequence as in clause 8.5.5.4.4 except for MBMS ACCESS INFORMATION message content (step 2) and CELL UPDATE message content (step 3).

| Step | Direction | | Message | Comments |
|------|-----------|------|---------|----------|
| | UE | SS | | |
| | | | | The UE is in cell_PCH |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |
| 2 | ← | | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE referring to the service the UE has joined and "Connected mode counting scope" IE set to "TRUE", "Access probability factor – connected" IE set to 0. |
| 3 | → | | CELL UPDATE | The UE shall perform the MBMS counting procedure which triggers the cell updating procedure which moves the UE into CELL_FACH state. The CELL UPDATE message shall contain the value "Cell Update Cause" set to "MBMS reception". |
| 4 | ← | | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to CELL_PCH. |
| 5 | ← | | MBMS ACCESS INFORMATION | The SS sends again in the same MP a MBMS access Information message. |
| 6 | | | | The SS check that the UE shall not perform again the counting procedure by sending another cell update message. |
| 7 | ←→ | | CALL C.4 | If the test result of C.4 indicates that UE is in CELL_PCH state, the test passes, otherwise it fails. |

Specific message contents

Same specific messages contents as in clause 8.5.5.4.4.

CELL UPDATE (Step 3)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---------------------|--------------|
| Cell update cause | MBMS reception |

CELL UPDATE CONFIRM (Step 4)

Use the same specific message content as in clause 8.5.5.4.4 for CELL UPDATE CONFIRM message at Step 4.

### 8.5.5.4m.5 Test requirements

At step 3, check that the UE performs the MBMS counting procedure by performing the cell update procedure using the cause value "MBMS reception".

At step 6, check that the UE does not perform the MBMS counting again during the same Modification Period.

## 8.5.5.5 Void

## 8.5.5.6 Void

## 8.5.5.7 RRC Connection establishment for MBMS Counting :Success after T318 Timeout/ MBMS Selected Service

### 8.5.5.7.1 Definition

This test case is applicable for UEs that support MBMS broadcast services.

### 8.5.5.7.2 Conformance requirement

The MBMS counting procedure is used by the UE to inform UTRAN about its interest to receive an MBMS transmission. The procedure applies to UEs supporting MBMS that are in idle mode or in connected mode for cells not operating in MBSFN mode as indicated in subclause 8.1.1.6.3.

…

The UE initiates the MBMS counting procedure for an MBMS transmission upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" with the value set to 'Acquire counting info' or set to "Acquire counting info– PTM RBs unmodified".

…

Upon receiving the MBMS ACCESS INFORMATION message for cells not operating in MBSFN mode as indicated in subclause 8.1.1.6.3 including one or more MBMS service(s) it has joined and/or including one or more MBMS Selected Services, the UE shall for each joined and/or selected service:

1> if the UE is in idle mode:

  2> draw a random number, "rand", uniformly distributed in the range: $0 \leq rand < 1$

  2> if 'rand' is lower than the value indicated by the IE 'Access probability factor-Idle' for the concerned service:

    3> indicate to upper layers that establishment of an RRC connection is required to receive the concerned MBMS service, with the establishment cause set to 'MBMS reception';

    3> if the above condition applies for more than one service, initiate a single indication to upper layers;

    3> if the RRC connection establishment succeeds, the procedure ends.

…

  1> submit the RRC CONNECTION REQUEST message for transmission on the uplink CCCH;

  1> set counter V300 to 1; and

  1> if the variable ESTABLISHMENT_CAUSE is set to "MBMS reception":

    2> when the MAC layer indicates success or failure to transmit the message:

      3> if the MAC layer indicates failure:

        4> enter idle mode;

        4> consider the procedure to be unsuccessful;

        4> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2;

   4> the procedure ends.

  3> else:

   4> start timer T318;

   4> apply value 0 for counter N300 regardless of the value included in IE "UE Timers and Constants in idle mode".

…

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

 …

 1> otherwise if the UE performs connection establishment for MBMS counting as specified in subclause 8.7.4; and

 1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

  2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

   3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

 1> if the UE included one or more "MBMS Selected Service ID" IEs:

  2> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

 …

If the counting response procedure (RRC connection establishment or Cell update) fails, the UE shall:

 1> if the failure occurs in the same modification period as the one in which the UE initiated the counting response procedure; or

 1> if the message triggering the MBMS counting procedure included the IE "Continue MCCH reading" with a value set to TRUE that is applicable in the modification period in which the UE detects the failure:

  2> continue acquiring further MBMS ACCESS INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

 1> otherwise:

  2> the procedure ends.

Reference

3GPP TS 25.331 clauses 8.7.4, 8.7.4.1, 8.7.4.2, 8.7.4.3, 8.1.3.2, 8.1.3.3, 8.7.4.5.

### 8.5.5.7.3      Test purpose

To confirm that the UE starts T318 timer once UE MAC layer indicates successful transmission of RRC Connection Request message for MBMS counting.

To verify that the UE continues to acquire MBMS ACCESS INFORMATION messages after Expiry of T318, and hence re-start RRC Connection Request procedure for counting.

### 8.5.5.7.4      Method of test

Initial Condition

System Simulator: 1 MBMS cell (cell 21).

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Longest MCCH scheduling configuration defined in 34.108 clause 11.1.1.3 is used.

Related ICS/IXIT statements

-   MBMS Broadcast service application available on UE    Yes/No.

Test Procedure

The SS transmits an MBMS MODIFIED SERVICE INFORMATION message which includes in the "Modified service list" for the MBMS activated service "MBMS required UE action" set to "Acquire counting info".

The SS transmits an MBMS ACCESS INFORMATION message, which includes the MBMS Short transmission ID associated to the MBMS activated service and "Access probability factor – Idle" set to 0.

NOTE:    The "Access probability factor" sent in the MBMS ACCESS INFORMATION message set to 0 corresponds to an actual Probability Factor = 1, according to the formula in TS 25.331 clause 10.2.16e.

The UE transmits an RRC CONNECTION REQUEST message to the SS, with "Establishment cause" set to "MBMS reception". After MAC indication on successful transmission, starts T318 timer.

SS does not respond to the RRC CONNECTION REQUEST message.

After expiry of T318, UE Re-acquires MBMS ACCESS INFORMATION, and re-starts the counting procedure. The UE transmits an RRC CONNECTION REQUEST message to the SS, with "Establishment cause" set to "MBMS reception".

The SS transmits an RRC CONNECTION SETUP message to the UE which moves the UE to CELL_DCH state.

When the UE receives this message, the UE establishes an RRC connection and transmits an RRC CONNECTION SETUP COMPLETE message.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| | | | | The UE is in idle mode. |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | The SS transmits the message, which includes "MBMS required UE action" set to "Acquire counting info" |
| 2 | ← | | MBMS ACCESS INFORMATION | The SS transmits the message, which includes "MBMS short transmission ID" IE referring to the service the UE has activated and "Access probability factor – Idle" IE set to 0 (corresponding to actual Access Probability = 1). |
| 3 | ← | | MBMS GENERAL INFORMATION | |
| 4 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS reception" |
| 5 | | | | SS does not respond to RRC Connection Request message in step 4. |
| 6 | → | | RRC CONNECTION REQUEST | The UE re-sends the message with Establishment cause set to "MBMS reception" with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 7 | ← | | RRC CONNECTION SETUP | SS assigns DPCH resources to allow UE to establish an RRC connection.<br>RRC state indicator set to CELL_DCH. |
| 8 | → | | RRC CONNECTION SETUP COMPLETE | |
| 8a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 8 and before step 10. |
| 9 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 10 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific Message Contents

System Information Block type 1 (FDD)

Use the default system information block with the same type specified in clause 6.1 of TS 34.108, with the following exceptions:

| Information Element | Value/remark |
|---------------------|--------------|
| - UE Timers and constants in idle mode | |
| -T300 | 8000 milliseconds |

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire counting info |
| - Continue MCCH reading | TRUE |

MBMS ACCESS INFORMATION (Step 2)

| Information Element | Value/remark |
|---|---|
| Service list | Only 1 entry |
| - MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| - Access probability factor – Idle | 0 (corresponding to the actual probability factor value 1) |

MBMS GENERAL INFORMATION (Step 3)

Use the default message type found in TS 34.108, 9.1.1 except for

| MBMS timers and counters | |
|---|---|
| - T318 | 1500 ms |

RRC CONNECTION REQUEST (Step 4 and 6)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI. |
| Establishment Cause | MBMS reception |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RRC CONNECTION SETUP (Step 7)

Use the default message type found in TS 34.108, 9.1.1.

RRC CONNECTION SETUP COMPLETE (Step 8)

Use the default message type found in TS 34.108, 9.1.1.

MBMS MODIFICATION REQUEST (steps 8a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
|   - MBMS Selected Services Full | |
|     - MBMS Selected Service ID | Only 1 entry |
|      - MBMS Service ID | MBMS service ID of the activated MBMS service |
|      - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|       - SameAs-MIB | (no data) |
|       - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

8.5.5.7.5 Test requirement

At step 4 and 6, the UE shall transmit an RRC CONNECTION REQUEST message with "Establishment Cause" set to "MBMS reception" on the uplink CCCH and including the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

The time difference between step 4 and 6 should be at least 1500 milliseconds (T318 expiry), and less than 6 seconds (T318 [1500ms] +2*AP [1280ms] +Transmission time on PRACH)

At step 8, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message on a dedicated channel.

## 8.5.5.7m RRC Connection establishment for MBMS Counting :Success after T318 Timeout / MBMS Multicast Service

8.5.5.7m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

8.5.5.7m.2 Conformance requirement

Same conformance requirement as in clause 8.5.5.7.2.

8.5.5.7m.3 Test purpose

Same test purpose as in clause 8.5.5.7.3.

8.5.5.7m.4 Method of test

Initial Condition

System Simulator: 1 MBMS cell (cell 21).

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE       Yes/No.

Test procedure

Same test procedure as in clause 8.5.5.7.4, except expected sequence step 8a is not applicable and at step 9 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.5.7.4 except for RRC CONNECTION REQUEST message content (step 4 and 6). Step 8a contents are not applicable.

RRC CONNECTION REQUEST (Step 4 and 6)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered P-TMSI. |
| Establishment Cause | MBMS reception |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | Not present |

8.5.5.7m.5 Test requirements

Same Test Requirements as in clause 8.5.5.7.5, except UE shall not include in the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity" in step 4 and 6.

## 8.5.5.8 RRC Connection establishment for MBMS Counting :Success after MAC Layer Failure Indication/ MBMS Selected Service

### 8.5.5.8.1 Definition

This test case is applicable for UEs that support MBMS broadcast services.

### 8.5.5.8.2 Conformance requirement

The MBMS counting procedure is used by the UE to inform UTRAN about its interest to receive an MBMS transmission. The procedure applies to UEs supporting MBMS that are in idle mode or in connected mode for cells not operating in MBSFN mode as indicated in subclause 8.1.1.6.3.

…

The UE initiates the MBMS counting procedure for an MBMS transmission upon receiving an MBMS MODIFIED SERVICES message including IE "MBMS required UE action" with the value set to 'Acquire counting info' or set to "Acquire counting info– PTM RBs unmodified".

…

Upon receiving the MBMS ACCESS INFORMATION message for cells not operating in MBSFN mode as indicated in subclause 8.1.1.6.3 including one or more MBMS service(s) it has joined and/or including one or more MBMS Selected Services, the UE shall for each joined and/or selected service:

1> if the UE is in idle mode:

   2> draw a random number, "rand", uniformly distributed in the range: $0 \leq$ rand $< 1$

   2> if 'rand' is lower than the value indicated by the IE 'Access probability factor-Idle' for the concerned service:

      3> indicate to upper layers that establishment of an RRC connection is required to receive the concerned MBMS service, with the establishment cause set to 'MBMS reception';

      3> if the above condition applies for more than one service, initiate a single indication to upper layers;

      3> if the RRC connection establishment succeeds, the procedure ends.

…

   1> submit the RRC CONNECTION REQUEST message for transmission on the uplink CCCH;

   1> set counter V300 to 1; and

   1> if the variable ESTABLISHMENT_CAUSE is set to "MBMS reception":

      2> when the MAC layer indicates success or failure to transmit the message:

         3> if the MAC layer indicates failure:

            4> enter idle mode;

            4> consider the procedure to be unsuccessful;

            4> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2;

            4> the procedure ends.

         3> else:

            4> start timer T318;

4> apply value 0 for counter N300 regardless of the value included in IE "UE Timers and Constants in idle mode".

…

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

   …

   1> otherwise if the UE performs connection establishment for MBMS counting as specified in subclause 8.7.4; and

   1> if one or more of the MBMS services for which the UE initiates the counting response concerns an MBMS Selected Service:

      2> for each MBMS Selected Service that is indicated on MCCH and for which the UE initiates the counting response:

         3> include the IE "MBMS Selected Service ID" within the IE "MBMS Selected Services Short" and set it to a value in accordance with subclause 8.6.9.8.

   1> if the UE included one or more "MBMS Selected Service ID" IEs:

      3> include the IE "MBMS Modification Period identity" and set it to a value in accordance with subclause 8.5.29.

   …

If the counting response procedure (RRC connection establishment or Cell update) fails, the UE shall:

   1> if the failure occurs in the same modification period as the one in which the UE initiated the counting response procedure; or

   1> if the message triggering the MBMS counting procedure included the IE "Continue MCCH reading" with a value set to TRUE that is applicable in the modification period in which the UE detects the failure:

      2> continue acquiring further MBMS ACCESS INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

   1> otherwise:

      2> the procedure ends.

Reference

3GPP TS 25.331 clauses 8.7.4, 8.7.4.1, 8.7.4.2, 8.7.4.3, 8.1.3.2, 8.1.3.3, 8.7.4.5.

8.5.5.8.3          Test purpose

To confirm that the UE does not start T318 timer once UE MAC layer indicates un-successful transmission of RRC Connection Request message for MBMS counting.

To verify that the UE continues to acquire MBMS ACCESS INFORMATION messages after MAC layer failure indication for first RRC Connection Request transmission, and hence re-start RRC Connection Request procedure for counting.

8.5.5.8.4          Method of test

Initial Condition

System Simulator: 1 MBMS cell (cell 21).

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE is interested in the selected service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Longest MCCH scheduling configuration defined in 34.108 clause 11.1.1.3 is used.

Related ICS/IXIT statements

- MBMS Broadcast service application available on UE    Yes/No.

Test Procedure

The SS transmits an MBMS MODIFIED SERVICE INFORMATION message which includes in the "Modified service list" for the MBMS activated service "MBMS required UE action" set to "Acquire counting info".

The SS transmits an MBMS ACCESS INFORMATION message, which includes the MBMS Short transmission ID associated to the MBMS activated service and "Access probability factor – Idle" set to 0.

NOTE: The "Access probability factor" sent in the MBMS ACCESS INFORMATION message set to 0 corresponds to an actual Probability Factor = 1, according to the formula in TS 25.331 clause 10.2.16e.

The UE submits RRC CONNECTION REQUEST message for transmission, with "Establishment cause" set to "MBMS reception".

SS does not acknowledge the RACH access on AICH.

After Failure indication by UE MAC Layer, UE Re-acquires MBMS ACCESS INFORMATION, and re-starts the counting procedure. The UE transmits RRC CONNECTION REQUEST message to the SS, with "Establishment cause" set to "MBMS reception".

The SS transmits an RRC CONNECTION SETUP message to the UE which moves the UE to CELL_DCH state.

When the UE receives this message, the UE establishes an RRC connection and transmits an RRC CONNECTION SETUP COMPLETE message.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| | | | | The UE is in idle mode. |
| 1 | ← | | MBMS MODIFIED SERVICES INFORMATION | The SS transmits the message, which includes "MBMS required UE action" set to "Acquire counting info" |
| 2 | ← | | MBMS ACCESS INFORMATION | The SS transmits the message, which includes "MBMS short transmission ID" IE referring to the service the UE activated and "Access probability factor – Idle" IE set to 0 (corresponding to actual Access Probability = 1). |
| 3 | ← | | MBMS GENERAL INFORMATION | |
| 4 | → | | ACCESS PREAMBLE(RRC CONNECTION REQUEST) | |
| 5 | | | | SS does not respond to ACCESS PREAMBLE on AICH channel. |
| 6 | | | | After Failure indication by MAC Layer, UE starts acquiring MBMS ACCESS INFORMATION |
| 7 | → | | RRC CONNECTION REQUEST | The UE re-sends the message with Establishment cause set to "MBMS reception". (SS ACKS on AICH for ACCESS PREAMBLE) |
| 8 | ← | | RRC CONNECTION SETUP | SS assigns DPCH resources to allow UE to establish an RRC connection. RRC state indicator set to CELL_DCH. |
| 9 | → | | RRC CONNECTION SETUP COMPLETE | |
| 9a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure. This message may be received at any point after step 9 and before step 11. |
| 10 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 11 | ←→ | | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific Message Contents

System Information Block type 1 (FDD)

Use the default system information block with the same type specified in clause 6.1 of TS 34.108, with the following exceptions:

| Information Element | Value/remark |
|---------------------|--------------|
| - UE Timers and constants in idle mode | |
| -T300 | 8000 milliseconds |

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire counting info |
| - Continue MCCH reading | TRUE |

MBMS ACCESS INFORMATION (Step 2)

| Information Element | Value/remark |
|---|---|
| Service list | Only 1 entry |
| - MBMS short transmission ID | Index to the MBMS transmission identity in the previous MBMS MODIFIED SERVICES INFORMATION |
| - Access probability factor – Idle | 0 (corresponding to the actual probability factor value 1) |

MBMS GENERAL INFORMATION (Step 3)

Use the default message type found in TS 34.108, 9.1.1 except for

| MBMS timers and counters | |
|---|---|
| - T318 | 16000 ms |

RRC CONNECTION REQUEST (Step 7)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered TMSI or P-TMSI. |
| Establishment Cause | MBMS reception |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | |
| - MBMS Selected Services | Only 1 entry |
|   - MBMS Selected Service ID | MBMS short transmission identity referring to the service the UE has selected |
| - Modification period identity | Indicates the modification period the MBMS short transmission identities refer to |

RRC CONNECTION SETUP (Step 8)

Use the default message type found in TS 34.108, 9.1.1.

RRC CONNECTION SETUP COMPLETE (Step 9)

Use the default message type found in TS 34.108, 9.1.1.

MBMS MODIFICATION REQUEST (steps 9a)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency request | Check that the IE is not present |
| MBMS RB list requested to be released | Check that the IE is not present |
| MBMS Selected Service Info | |
| - CHOICE Status | Some |
|   - MBMS Selected Services Full | |
|     - MBMS Selected Service ID | Only 1 entry |
|       - MBMS Service ID | MBMS service ID of the activated MBMS service |
|       - CHOICE PLMN identity | Check to see that one of the below choice element is present |
|         - SameAs-MIB | (no data) |
|         - explicitPLMN_Id | Check to see if it is set to the same value as "PLMN ID" in the Master Information block transmitted for the current serving cell. |

8.5.5.8.5 Test requirement

At step 7, the UE shall transmit an RRC CONNECTION REQUEST message with "Establishment Cause" set to "MBMS reception" on the uplink CCCH and including the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity".

The time difference between step 4(last Access Preamble Reception) and 7 should be at least 1280 milliseconds (one AP), and less than 4 seconds (2*AP[1280ms]+Transmission time on PRACH).

At step 9, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message on a dedicated channel.

## 8.5.5.8m RRC Connection establishment for MBMS Counting :Success after MAC Layer Failure Indication / MBMS Multicast Service

### 8.5.5.8m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.5.8m.2 Conformance requirement

Same conformance requirement as in clause 8.5.5.8.2.

### 8.5.5.8m.3 Test purpose

Same test purpose as in clause 8.5.5.8.3.

### 8.5.5.8m.4 Method of test

Initial Condition

System Simulator: 1 MBMS cell (cell 21).

User Equipment:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE        Yes/No.

Test procedure

Same test procedure as in clause 8.5.5.8.4, except expected sequence step 9a is not applicable and at step 10 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.5.8.4 except for RRC CONNECTION REQUEST message content (step 7). Step 9a contents are not applicable.

RRC CONNECTION REQUEST (Step 7)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Initial UE identity | Same as the registered P-TMSI. |
| Establishment Cause | MBMS reception |
| Protocol Error Indicator | Check to see if it is set to FALSE |
| Measured results on RACH | Not checked. |
| MBMS Selected Services | Not present |

8.5.5.8m.5                    Test requirements

Same Test Requirements as in clause 8.5.5.8.5, except UE shall not include in the IE "MBMS Selected Service ID" of the concerned MBMS selected service within the IE "MBMS Selected Services Short" and the IE "MBMS Modification Period identity" in step 7.

# 8.5.6      MBMS Controlling Cell Change

## 8.5.6.1      MBMS Controlling Cell Change - Idle mode - Frequency Layer Convergence – HCS Not Used / MBMS Selected Service

### 8.5.6.1.1                    Definition

Test to verify that the UE performs the cell reselection correctly if system information parameters Qoffset, Qhyst, Qoffmbms and Treselection are applied for non-hierarchical cell structures. This test case is applicable for all UEs that support MBMS broadcast services.

### 8.5.6.1.2                    Conformance requirement

When camped normally, the UE shall perform the following tasks:

-    select and monitor the indicated PICH and PCH of the cell as specified in clause 8 according to information sent in system information;

-    monitor relevant System Information. This is specified in [8];

-    perform necessary measurements for the cell reselection evaluation procedure;

-    execute the cell reselection evaluation process on the following occasions/triggers:

    1)   UE internal triggers, so as to meet performance as specified in [22] and [23];

    2)   When information on the BCCH used for the cell reselection evaluation procedure has been modified

If the UE supports MBMS and MBMS is active in the cell and the UE is permitted to receive MBMS services in the cell, the UE shall perform MBMS tasks as specified in subclause 6.3 of TS 25.304.

…

The cell-ranking criterion R is defined by:

$$R_s = Q_{meas,s} + Qhyst_s + Qoffmbms$$

$$R_n = Q_{meas,n} - Qoffset_{s,n} + Qoffmbms - TO_n * (1 - L_n)$$

where:

the signalled value Qoffmbms is only applied to those cells (serving or neighbouring) belonging to the MBMS PL

…

The cells shall be ranked according to the R criteria specified above, deriving $Q_{meas,n}$ and $Q_{meas,s}$ and calculating the R values using CPICH RSCP, P-CCPCH RSCP and the averaged received signal level as specified in [22] and [23] for FDD, TDD and GSM cells, respectively.

The offset $Qoffset1_{s,n}$ is used for $Qoffset_{s,n}$ to calculate $R_n$, the hysteresis $Qhyst1_s$ is used for $Qhyst_s$ to calculate $R_s$. For UE in RRC connected mode states CELL_PCH or URA_PCH the hysteresis $Qhyst_s$ takes the value $Qhyst1_{sPCH}$ to calculate $R_s$, if provided in SIB4 [see 8]. For UE in RRC connected mode state CELL_FACH the hysteresis $Qhyst_s$ takes the value $Qhyst1_{s,FACH}$ to calculate $R_s$, if provided in SIB4 [see 8].

…

If an FDD cell is ranked as the best cell and the quality measure for cell selection and re-selection is set to CPICH RSCP, the UE shall perform cell re-selection to that FDD cell. If this cell is found to be not suitable, the UE shall behave according to subclause 5.2.6.1.3 of TS 25.304.

…

In all cases, the UE shall reselect the new cell, only if the following conditions are met:

- the new cell is better ranked than the serving cell during a time interval Treselection. For UE in RRC connected mode states CELL_PCH or URA_PCH the interval $Treselection_{s,PCH}$ applies, if provided in SIB4 [see 8], while for UE in RRC connected mode state CELL_FACH the interval $Treselection_{s,FACH}$ applies, if provided in SIB4 [see 8]. For hierarchical cell structures when high mobility state has not been detected, if according to the HCS rules the serving cell is not ranked then all the ranked cells are considered to be better ranked than the serving cell.

Reference

3GPP TS 25.304 clauses 5.2.5.1, 5.2.6.1.4.

8.5.6.1.3 Test purpose

1. To verify that a UE in idle mode calculates R from Qhyst, and Qoffset and Qoffmbms, which triggers the cell reselection evaluation process.

2. To verify that a UE in idle mode performs a Serving Cell Reselection to the Preferred Layer at Session Start.

3. To verify that a UE in idle mode performs an intra-frequency Cell Reselection on the Preferred Layer during an ongoing Session

8.5.6.1.4 Method of test

Initial Condition

System Simulator: 3 MBMS cells (Cell 21, Cell 24, Cell 26) with the downlink transmission power shown in column marked "T0" in table 8.5.6.1-1.

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108 and camped on Cell 21.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Specific message contents for System information blocks 3 and 11 are used in Cell 21.

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE Yes/No

Test procedure

Table 8.5.6.1-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while columns marked "T1" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.5.6.1-1**

| Parameter | Unit | Cell 21 | | Cell 24 | | Cell 26 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | | High Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | -60 | -66 | -75 | -75 | -66 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -60 | -66 | -75 | -75 | -66 |

The UE is in idle mode in Cell 21.

The SS notifies on MICH and MCCH in Cell 1 about the start of an MBMS session including a preferred frequency in the IE "MBMS preferred frequency". The UE reselects to Cell 24 (Frequency Layer Convergence).

The SS transmits an MBMS MODIFIED SERVICE INFORMATION message which includes in the "Modified service list" for the MBMS activated service "MBMS required UE action" set to "Acquire counting info" and MBMS ACCESS INFORMATION message, which includes the MBMS Short Transmission ID associated to the MBMS activated service and "Access probability factor – Idle" set to 0 (corresponds to an actual Probability Factor = 1).

The UE shall transmit an RRC CONNECTION REQUEST message, with "Establishment cause" set to "MBMS reception". The SS transmits a RRC CONNECTION SETUP. The UE establishes an RRC connection and transmits an RRC CONNECTION SETUP COMPLETE message.

The UE receives an MBMS MODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to "Acquire PTM RB info". The UE receives an MBMS NEIGHBOURING CELL P-T-M RB INFORMATION including MBMS neighbouring cell information for Cell 26. The UE shall apply the MBMS p-t-m radio bearer configuration procedure to acquire the radio bearer configuration for the MBMS service provided by the SS.

The UE starts receiving the indicated p-t-m radio bearer.

The SS applies the power settings of "T1" in table 8.5.6.1-1. Then the UE shall reselect to Cell 26 applying the Qoffmbms.

The UE receives an MBMS UNMODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to "Acquire PTM RB info". The UE receives an MBMS NEIGHBOURING CELL P-T-M RB INFORMATION including MBMS neighbouring cell information for Cell 24. The UE shall apply the MBMS p-t-m radio bearer configuration and continues receiving the indicated p-t-m radio bearer.

SS calls for generic procedure C.1 to check that UE is in idle mode.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | UE | | | The UE is in idle mode on Cell 21. |
| 2 | ← | | SYSTEM INFORMATION | See specific message contents for SIB3 |
| 3 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "none" and the "MBMS preferred frequency" IE indicates the reference to Ch. 2. |
| 4 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information is set to Ch. 2. Qoffmbms is set to 12 dB. |
| 5 | UE | | | UE reselects to Cell 24 |
| 5a | SS | | | The following MCCH messages are sent on Cell 24. |
| 6 | ← | | MBMS MODIFIED SERVICES INFORMATION | Transmitted "MBMS required UE action" IE is set to "Acquire counting info" |
| 7 | ← | | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE set to 1, "Access probability factor – Idle" set to 0 (corresponding to the actual probability factor value 1). |
| 8 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 9 | → | | RRC CONNECTION REQUEST | The UE transmits the message with Establishment cause set to "MBMS reception" and in case of MBMS Selected service with the "MBMS Selected Services Short" IE referring to the concerned MBMS Selected service and the corresponding Modification period identity. |
| 10 | ← | | RRC CONNECTION SETUP | |
| 11 | → | | RRC CONNECTION SETUP COMPLETE | |
| 11a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure in case of MBMS selected Service. This message may be received at any point after step 11 and before step 13. |
| 12 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 13 | ← | | RRC CONNECTION RELEASE | |
| 14 | → | | RRC CONNECTION RELEASE COMPLETE | The UE shall enter idle state. |
| 15 | ← | | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. |
| 16 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 17 | ← | | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 26 |
| 18 | SS | | | The SS applies the power settings of "T1" in Table 8.5.6.1-1 |

| 19 | UE | | UE performs reselection applying Qoffmbms and reselects the Cell 26 |
|---|---|---|---|
| 20 | ← | MBMS UNMODIFIED SERVICES INFORMATION | There is no change in MBMS services already ongoing in previous cell |
| 21 | ← | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 22 | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 24 |
| 23 | ←→ | CALL C.1 | If the test result of C.1 indicates that UE is in idle mode, the test passes, otherwise it fails. |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 3 (Step 2)

| Information Element | Value/remark |
|---|---|
| Sintersearch | Not Present |

MBMS MODIFIED SERVICES INFORMATION (Step 3)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | None |
| - MBMS preferred frequency | |
| - PFL index | Index for Ch 2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |
| - Continue MCCH reading | FALSE |

MBMS GENERAL INFORMATION (Step 4)

| Information Element | Value/remark |
|---|---|
| MBMS preferred frequency information | |
| - MBMS preferred frequency list | Only 1 entry |
| - MBMS preferred frequency | Ch 2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |
| - CHOICE Layer convergence information | |
| - No HCS | |
| - Qoffmbms | 12 dB |

MBMS MODIFIED SERVICES INFORMATION (Step 6)

| Information Element | Value/remark |
|---|---|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire counting info |
| - Continue MCCH reading | FALSE |

MBMS MODIFIED SERVICES INFORMATION (Step 15)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Modified service list | |
|   - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
|   - MBMS required UE action | Acquire PTM RB info |
| MBMS p-t-m activation time | SS shall choose a value which is sufficient far ahead for the UE to establish the MTCH |

MBMS UNMODIFIED SERVICES INFORMATION (Step 20)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Unmodified service list | |
|   - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
|   - MBMS required UE action | Acquire PTM RB info |

#### 8.5.6.1.5           Test requirement

After step 6, the UE upon receiving an MBMS MODIFIED SERVICES INFORMATION message with IE "MBMS required UE action" set to 'Acquire counting info', shall perform the counting procedure.

At step 8, the UE shall send an RRC CONNECTION REQUEST message with "Establishment cause" set to 'MBMS reception'.

After step 15, the UE shall reselect to Cell 26 applying the Qoffmbms and the SS shall check that the UE is camped on Cell 26 in idle mode.

## 8.5.6.1m       MBMS Controlling Cell Change - Idle mode - Frequency Layer Convergence – HCS Not Used / MBMS Multicast Service

#### 8.5.6.1m.1          Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.6.1m.2          Conformance requirement

Same conformance requirement as in clause 8.5.6.1.2

#### 8.5.6.1m.3          Test purpose

Same test purpose as in clause 8.5.6.1.3.

#### 8.5.6.1m.4          Method of test

Initial condition

System Simulator:

      3 MBMS cells , Cell 21, Cell 24, Cell 26.

User Equipment:

      The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

      The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

   -    MBMS Multicast service application available on UE         Yes/No.

Test procedure

Same test procedure as in clause 8.5.6.1.4, except that at step 12 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.6.1.4

### 8.5.6.1m.5 Test requirements

Same test requirement as in clause 8.5.6.1.5.

## 8.5.6.2 MBMS Controlling Cell Change in CELL_FACH during ongoing session / MBMS Broadcast Service

### 8.5.6.2.1 Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services.

### 8.5.6.2.2 Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

The UE may:

> 1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state; and

> 1> if not receiving an MBMS service provided via a p-t-m radio bearer:

>> 2> monitor the MBMS notification Indicator Channel (MICH).

>> 2> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

>>> 3> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331;

>>> 3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4 of TS 25.331.

The UE shall:

> 1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

>> 2> if receiving an MBMS service that is provided via a p-t-m radio bearer; or

>> 2> if not receiving an MBMS service that is provided via a p-t-m radio bearer and not monitoring MICH:

>>> 3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3 of TS 25.331;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4 of TS 25.331.

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info– PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

Reference

3GPP TS 25.331 clause 8.7.2.3, 8.7.3.3.1, 8.6.9.6.

### 8.5.6.2.3 Test purpose

1. To verify that a UE in CELL_FACH state performs an inter-frequency MBMS Controlling Cell Change during an ongoing Session.

2. To verify that a UE in CELL_FACH state performs an intra-frequency MBMS Controlling Cell Change during an ongoing Session.

3. To verify that the UE is able to read MCCH in combination with FACH measurements.

4. To verify that a UE in CELL_FACH is able to apply MBMS NEIGHBOURING CELLS P-T-M RB INFORMATION and receive data on this p-t-m radio bearer.

### 8.5.6.2.4 Method of test

Initial Condition

System Simulator:

3 MBMS cells, Cell 21, Cell 24 and Cell 26.

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Specific message contents for System information blocks 3 and 11 are used in Cell 21.

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

Test Procedure

Table 8.5.6.2-1 illustrates the downlink power to be applied for the 3 cells in this test case. Initially, the SS applies the power settings of column "T0".

**Table 8.5.6.2-1**

| Parameter | Unit | Cell 21 | | | Cell 24 | | | Cell 26 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T0 | T1 | T2 | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | High Range Test Frequency | | | High Range Test Frequency | | |
| CPICH Ec ( FDD ) | dBm/3.84 MHz | -60 | -80 | -80 | -70 | -60 | -70 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -80 | -80 | -70 | -60 | -70 | -70 | -70 | -60 |

The UE is in CELL_FACH state in Cell 21. The SS notifies on MICH and MCCH about the start of an MBMS session and waits for the UE to activate MTCH reception. The MBMS radio bearer on MTCH is put into loopback mode 3.

The SS sends 10 RLC SDUs of MBMS data on MTCH in Cell 21 on the concerned MBMS radio bearer. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the UE has received at least one RLC SDUs.

The SS applies the power settings of "T1" in table 8.5.6.2-1. Then the UE shall reselect to Cell 24 and send a CELL UPDATE message on the CCCH. SS then replies with CELL UPDATE CONFIRM message on the downlink DCCH.

The SS provides information about the ongoing MBMS service in cell 24 by sending MBMS UNMODIFIED SERVICES INFORMATION. The SS informs the UE about Cell 26 as neighbouring cell by sending MBMS NEIGHBOURING CELL P-T-M RB INFORMATION in Cell 24. The MBMS radio bearer on MTCH is put into loopback mode 3, and SDU counter is reset to 0.The SS transmits 10 RLC SDUs of MBMS data in Cell 24. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than zero.

The SS transmits 10 RLC SDUs of MBMS data in neighbouring Cell 26. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the number reported previously at step 16 of expected sequence.

The SS applies the power settings of "T2" in table 8.5.6.2-1. Then the UE shall reselect to Cell 26 and send a CELL UPDATE message on the CCCH. SS then replies with CELL UPDATE CONFIRM message on the downlink DCCH.

The SS provides information about the ongoing MBMS service in cell 26 by MBMS UNMODIFIED SERVICES INFORMATION. The SS informs the UE about Cell 24 as neighbouring cell by sending MBMS NEIGHBOURING CELL P-T-M RB INFORMATION in Cell 26.

The SS transmits 10 RLC SDUs of MBMS data in Cell 26. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the number reported by the UE previously at step 19 of expected sequence.

The SS transmits 10 RLC SDUs of MBMS data in neighbouring Cell 24. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the number reported by the UE at step 27 of expected sequence. The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.2 to check that UE is in CELL_FACH state.

NOTE: If the UE fails the test because of selecting the wrong cell, the operator may re-run the test.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|----|---------|---------|
| | UE | SS | | |
| 0 | | ← | SYSTEM INFORMATION | See specific message contents for SIB3 and SIB11 |
| 1 | | ← | ACTIVATE RB TEST MODE | |
| 2 | | → | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | | ← | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. |
| 4 | | ← | CLOSE UE TEST LOOP | |
| 5 | | → | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 6 | SS | | | The SS broadcasts 10 RLC SDUs of MBMS data in Cell 21. |
| 7 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 8 | | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data in Cell 21. The SS checks that the number of reported RLC PDUs is greater than zero and records that value. |
| 9 | SS | | | The SS applies the power settings of "T1" in table 8.5.6.2-1. |
| 10 | | → | CELL UPDATE | This message is transmitted in Cell 24. |
| 11 | | ← | CELL UPDATE CONFIRM | |
| 11a | | → | UTRAN MOBILITY INFORMATION CONFIRM | After receipt of this message the SS waits for the UE to establish the MTCH |
| 11b | | ← | CLOSE UE TEST LOOP | |
| 11c | | → | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 12 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | |
| 13 | | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 26 |
| 14 | SS | | | The SS transmits 10 RLC SDUs of MBMS data in Cell 24. |
| 15 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 16 | | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data also in Cell 24. The SS checks that the number of reported RLC PDUs is greater than 0. |
| 17 | SS | | | The SS transmits 10 RLC SDUs of MBMS data in neighbouring Cell 26. |
| 18 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 19 | | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data also from Cell 26. The SS checks that the number of reported RLC PDUs is greater than the value at step 16. |
| 20 | SS | | | The SS applies the power settings of "T2" in table 8.5.6.2-1 |

| 21 | → | CELL UPDATE | This message is transmitted in cell 26 |
|----|---|---|---|
| 22 | ← | CELL UPDATE CONFIRM | |
| 22a | → | UTRAN MOBILITY INFORMATION CONFIRM | |
| 23 | ← | MBMS UNMODIFIED SERVICES INFORMATION | |
| 24 | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for cell 24 RAB |
| 25 | SS | | The SS transmits 10 RLC SDUs of MBMS data in Cell 26. |
| 26 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 27 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data also in Cell 26. The SS checks that the number of reported RLC PDUs is greater than the value at step 19. |
| 28 | SS | | The SS transmits 10 RLC SDUs of MBMS data in neighbouring Cell 24. |
| 29 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 30 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data also from neighbouring cell 24. The SS checks that the number of reported RLC PDUs is greater than the value at step 27. |
| 31 | ← | OPEN UE TEST LOOP | |
| 32 | → | OPEN UE TEST LOOP COMPLETE | |
| 33 | ←→ | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 3 (Step 0)

| Information Element | Value/remark |
|---|---|
| Sintersearch | Not Present |

SYSTEM INFORMATION BLOCK TYPE 11 (Step 0) (FDD)

| Information Element | Value/remark |
|---|---|
| FACH measurement occasion cycle length coefficient | 3 |
| Inter-frequency FDD measurement indicator | TRUE |

SYSTEM INFORMATION BLOCK TYPE 11 (Step 0) (1.28Mcps TDD)

| Information Element | Value/remark |
|---|---|
| FACH measurement occasion cycle length coefficient | 3 |
| Inter-frequency TDD 1.28 Mcps measurement indicator | TRUE |

SYSTEM INFORMATION BLOCK TYPE 11 (Step 0) (3.84Mcps TDD)

| Information Element | Value/remark |
|---|---|
| FACH measurement occasion cycle length coefficient | 2 |
| Inter-frequency TDD 3.84 Mcps measurement indicator | TRUE |

SYSTEM INFORMATION BLOCK TYPE 11 (Step 0) (7.68Mcps TDD)

| Information Element | Value/remark |
|---|---|
| FACH measurement occasion cycle length coefficient | 2 |
| Inter-frequency TDD 7.68 Mcps measurement indicator | TRUE |

MBMS UNMODIFIED SERVICES INFORMATION (Step 12 and 23)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Unmodified service list | |
|   - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
|   - MBMS required UE action | Acquire PTM RB info |

CELL UPDATE (Step 10 and 21)

| Information Element | Value/remark |
|---|---|
| Cell update cause | Check that the value is set to "Cell reselection" |

CELL UPDATE CONFIRM (Step 11 and 22)

Use the same message sub-type found in TS 34.108, clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| New C-RNTI | '1010 1010 1010 1010' |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Steps 8, 16, 19, 27 and 30)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than previous sub-test |

8.5.6.2.5          Test requirement

After step 7, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

After step 9, the UE shall transmit a CELL UPDATE message in Cell 24.

After step 15, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

After step 18, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 16.

After step 26, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 19.

After step 29, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 27.

# 8.5.6.2m     MBMS Controlling Cell Change in CELL_FACH during ongoing session / MBMS Multicast Service

8.5.6.2m.1          Definition

This test is applicable for all UEs that support MBMS multicast services.

8.5.6.2m.2          Conformance requirement

Same conformance requirement as in clause 8.5.6.2.2

### 8.5.6.2m.3 Test purpose

Same test purpose as in clause 8.5.6.2.3.

### 8.5.6.2m.4 Method of test

**Initial condition**

System Simulator:

> 2 MBMS cells, Cell 21 and Cell 24

User Equipment:

> The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

> The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

**Related ICS/IXIT statements**

- MBMS Multicast service application available on UE        Yes/No.

**Test procedure**

Same test procedure as in clause 8.5.6.2.4.

**Specific message contents**

Same specific messages contents as in clause 8.5.6.2.4

### 8.5.6.2m.5 Test requirements

Same test requirement as in clause 8.5.6.2.5.

## 8.5.6.3 MBMS Controlling Cell Change in CELL_PCH during ongoing session / MBMS Broadcast Service

### 8.5.6.3.1 Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services.

### 8.5.6.3.2 Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

The UE may:

> 1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state; and

> 1> if not receiving an MBMS service provided via a p-t-m radio bearer:

2> monitor the MBMS notification Indicator Channel (MICH).

2> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4 of TS 25.331.

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if receiving an MBMS service that is provided via a p-t-m radio bearer; or

2> if not receiving an MBMS service that is provided via a p-t-m radio bearer and not monitoring MICH:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3 of TS 25.331;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4 of TS 25.331.

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

Reference

3GPP TS 25.331 clauses 8.7.2.3, 8.7.3.3.1, 8.6.9.6.

### 8.5.6.3.3 Test purpose

1. To verify that a UE in CELL_PCH state performs an inter-frequency MBMS Controlling Cell Change during an ongoing Session.

2. To verify that a UE in CELL_PCH state performs an intra-frequency MBMS Controlling Cell Change during an ongoing Session.

3. To verify that a UE in CELL_PCH is able to apply MBMS NEIGHBOURING CELLS P-T-M RB INFORMATION and receive data on this p-t-m radio bearer.

### 8.5.6.3.4 Method of test

Initial Condition

System Simulator:

3 MBMS cells, Cell 21, Cell 24 and Cell 26.

User Equipment:

The UE is in CELL_FACH state as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

Test Procedure

Table 8.5.6.3-1 illustrates the downlink power to be applied for the 2 cells in this test case. Initially, the SS applies the power settings of column "T0".

**Table 8.5.6.3-1**

| Parameter | Unit | Cell 21 | | | Cell 24 | | | Cell 26 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T0 | T1 | T2 | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | High Range Test Frequency | | | High Range Test Frequency | | |
| CPICH Ec ( FDD ) | dBm/3.84 MHz | -60 | -80 | -80 | -70 | -60 | -70 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -80 | -80 | -70 | -60 | -70 | -70 | -70 | -60 |

The UE is in CELL_FACH state in Cell 21. The SS notifies on MICH and MCCH about the start of an MBMS session and waits for the UE to activate MTCH reception.

The SS orders the UE to move to CELL_PCH state by transmitting a PHYSICAL CHANNEL RECONFIGURATION message with the RRC state indicator set to "CELL_PCH".

The SS applies the power settings of "T1" in table 8.5.6.3-1. At this point the UE shall reselect to Cell 24 and send a CELL UPDATE message on the CCCH. SS then replies with CELL UPDATE CONFIRM message on the downlink DCCH and orders the UE to stay in CELL_FACH state. The UE replies with a UTRAN MOBILITY INFORMATION CONFIRM message, and waits for the UE to activate MTCH reception. The MBMS radio bearer on MTCH is put into loopback mode 3.

The SS orders the UE to move to CELL_PCH state by transmitting a PHYSICAL CHANNEL RECONFIGURATION message with the RRC state indicator set to "CELL_PCH". The UE responds with PHYSICAL CHANNEL RECONIGURATION COMPLETE.

The SS provides information about the ongoing MBMS service in cell 24 by sending MBMS UNMODIFIED SERVICES INFORMATION. The SS informs the UE about Cell 26 as neighbouring cell by sending MBMS NEIGHBOURING CELL P-T-M RB INFORMATION in Cell 24. The SS sends 10 RLC SDUs of MBMS data in neighbouring cell 26.

The SS transmits a PAGING TYPE 1 message to the UE on the PCH and the UE moves to CELL_FACH state, sending a CELL UPDATE message. The SS replies with a CELL UPDATE CONFIRM message and UE confirms the received C-RNTI to be used in CELL FACH state by transmitting a UTRAN MOBILITY INFORMATION CONFIRM message on the uplink DCCH.

Then the SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the number reported previously at step 14 of expected sequence.

The SS orders the UE to move to CELL_PCH state by transmitting a PHYSICAL CHANNEL RECONFIGURATION message with the RRC state indicator set to "CELL_PCH". When the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message has been received, the SS sends 10 RLC SDUs of MBMS data in serving Cell 24.

The SS applies the power settings of "T2" in table 8.5.6.3-1. At this point the UE shall reselect to Cell 26 and send a CELL UPDATE message on the CCCH. SS then replies with CELL UPDATE CONFIRM message on the downlink DCCH and orders the UE to stay in CELL_FACH state. The UE replies with a UTRAN MOBILITY INFORMATION CONFIRM message.

The SS provides information about the ongoing MBMS service in cell 26 by sending MBMS UNMODIFIED SERVICES INFORMATION. The SS informs the UE about Cell 24 as neighbouring cell by sending MBMS NEIGHBOURING CELL P-T-M RB INFORMATION in Cell 26.

The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the UE has received greater number of RLC SDU than reported in previous step 25 of expected sequence.

The SS orders the UE to move to CELL_PCH state by transmitting a PHYSICAL CHANNEL RECONFIGURATION message with the RRC state indicator set to "CELL_PCH" and the UE responds with PHYSICAL CHANNEL RECONIGURATION COMPLETE.

The SS sends 10 RLC SDUs of MBMS data in neighbouring Cell 24.The SS transmits a PAGING TYPE 1 message to the UE on the PCH and the UE moves to CELL_FACH state, sending a CELL UPDATE message. The SS replies with a CELL UPDATE CONFIRM message and UE confirms the received C-RNTI to be used in CELL FACH state by transmitting a UTRAN MOBILITY INFORMATION CONFIRM message on the uplink DCCH.

The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the number previously reported by the UE at step 34 of expected sequence.

The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.2 to check that UE is in CELL_FACH state.

   NOTE:   If the UE fails the test because of selecting the wrong cell, the operator may re-run the test.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|----|---------|---------|
| | UE | SS | | |
| 1 | | ← | ACTIVATE RB TEST MODE | |
| 2 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | | ← | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. |
| 4 | | | Void | |
| 5 | | | Void | |
| 6 | | ← | PHYSICAL CHANNEL RECONFIGURATION | |
| 7 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE now transits to CELL_PCH state |
| 8 | | | Void | |
| 9 | SS | | | The SS applies the power settings of "T1" in table 8.5.6.3-1. |
| 10 | → | | CELL UPDATE | This message is transmitted in Cell 24. |
| 11 | | ← | CELL UPDATE CONFIRM | |
| 12 | → | | UTRAN MOBILITY INFORMATION CONFIRM | The UE stays in CELL_FACH state in Cell 24. The SS waits for the UE to establish the MTCH |
| 13 | | ← | CLOSE UE TEST LOOP | |
| 14 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 15 | | ← | PHYSICAL CHANNEL RECONFIGURATION | |
| 16 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE now transits to CELL_PCH state |
| 17 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | |
| 18 | | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 26 |
| 19 | | | | The SS transmits 10 RLC SDUs of MBMS data from neighbouring Cell 26. |
| 20 | | ← | PAGING TYPE 1 | |
| 21 | → | | CELL UPDATE | Paging response |
| 22 | | ← | CELL UPDATE CONFIRM | |
| 23 | → | | UTRAN MOBILITY CONFIRM | |
| 24 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 25 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than 0. |
| 26 | | ← | PHYSICAL CHANNEL RECONFIGURATION | |
| 27 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE now transits to CELL_PCH state |
| 28 | SS | | | The SS transmits 10 RLC SDUs of MBMS data from Cell 24. |
| 29 | SS | | | The SS applies the power settings of "T2" in table 8.5.6.3-1 |
| 30 | → | | CELL UPDATE | This message is transmitted in Cell 26. |
| 31 | | ← | CELL UPDATE CONFIRM | |
| 32 | → | | UTRAN MOBILITY INFORMATION CONFIRM | The UE stays in CELL_FACH state in Cell 26 |

| 33 | ← | MBMS UNMODIFIED SERVICES INFORMATION | |
|----|----|----|----|
| 34 | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 24 |
| 35 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 36 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than the previously reported number of RLC PDUs at step 25. |
| 37 | ← | PHYSICAL CHANNEL RECONFIGURATION | |
| 38 | → | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE now transits to CELL_PCH state |
| 39 | | | The SS transmits 10 RLC SDUs of MBMS data from neighbouring Cell 24. |
| 40 | ← | PAGING TYPE 1 | |
| 41 | → | CELL UPDATE | Paging response |
| 42 | ← | CELL UPDATE CONFIRM | |
| 43 | → | UTRAN MOBILITY INFORMATION CONFIRM | |
| 44 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 45 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than the previously reported number of RLC PDUs at step 34. |
| 46 | ← | OPEN UE TEST LOOP | |
| 47 | → | OPEN UE TEST LOOP COMPLETE | |
| 48 | ←→ | CALL C.2 | If the test result of C.2 indicates that UE is in CELL_FACH state, the test passes, otherwise it fails. |

Specific Message Contents

MBMS UNMODIFIED SERVICES INFORMATION (Step 17 and 33)

| Information Element | Value/remark |
|----|----|
| Message type | |
| Unmodified service list | |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |

PHYSICAL CHANNEL RECONFIGURATION (Steps 6, 15, 26 and 37)

Use the same message sub-type titled "Packet to CELL_FACH from CELL_FACH in PS" in TS 34.108 clause 9 with following exceptions:

| Information Element | Value/remark |
|----|----|
| RRC State Indicator | CELL_PCH |
| UTRAN DRX cycle length coefficient | 7 |

PAGING TYPE 1 (Step 20 and 40)

Use the following message:

| Information Element | Value/remark |
|---|---|
| Message Type | |
| Paging record list | Only 1 entry |
| Paging record | |
|   - CHOICE Used paging identity | UTRAN identity |
|    - U-RNTI | |
|     - SRNC Identity | Set to the previously assigned SRNC identity |
|     - S-RNTI | Set to previously assigned S-RNTI |
|    - CN originated page to connected mode UE | Not Present |
| BCCH modification info | Not Present |

CELL UPDATE (Steps 10 and 30)

| Information Element | Value/remark |
|---|---|
| Cell update cause | Check that the value is set to "Cell reselection" |

CELL UPDATE CONFIRM (Steps 11, 22, 31 and 42)

Use the same message sub-type found in TS 34.108, clause 9, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| New C-RNTI | '1010 1010 1010 1010' |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 14)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero |

CELL UPDATE (Steps 21 and 41)

| Information Element | Value/remark |
|---|---|
| Cell update cause | Check that the value is set to "Paging response" |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 25, 36 and 45)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than the value reported at the previous sub-test. |

8.5.6.3.5 Test requirement

After step 9, the UE shall transmit a CELL UPDATE message in Cell 24.

After step 24, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

After step 35, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 25.

After step 44, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 36.

### 8.5.6.3m MBMS Controlling Cell Change in CELL_PCH during ongoing session / MBMS Multicast Service

#### 8.5.6.3m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

#### 8.5.6.3m.2 Conformance requirement

Same conformance requirement as in clause 8.5.6.3.2

#### 8.5.6.3m.3 Test purpose

Same test purpose as in clause 8.5.6.3.3.

#### 8.5.6.3m.4 Method of test

Initial condition

System Simulator:

2 MBMS cells, Cell 21 and Cell 24

User Equipment:

The UE is in CELL_PCH state as specified in clause 7.6 of TS 34.108.

The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

- MBMS Multicast service application available on UE Yes/No.

Test procedure

Same test procedure as in clause 8.5.6.3.4.

Specific message contents

Same specific messages contents as in clause 8.5.6.3.4

#### 8.5.6.3m.5 Test requirements

Same test requirement as in clause 8.5.6.3.5.

### 8.5.6.4 MBMS Controlling Cell Change - Idle mode - Frequency Layer Convergence – With HCS / MBMS Selected Service

#### 8.5.6.4.1 Definition

Test to verify that the UE performs the cell reselection correctly for hierarchical cell structures. This shall be done according to the HCS priority, the received signal quality value Q and the quality level threshold criterion H. This test case is applicable for all UEs that support MBMS broadcast services.

#### 8.5.6.4.2 Conformance requirement

When camped normally, the UE shall perform the following tasks:

- select and monitor the indicated PICH and PCH of the cell as specified in clause 8 according to information sent in system information;

- monitor relevant System Information. This is specified in [8];

- perform necessary measurements for the cell reselection evaluation procedure;

- execute the cell reselection evaluation process on the following occasions/triggers:

1) UE internal triggers, so as to meet performance as specified in [22] and [23];

2) When information on the BCCH used for the cell reselection evaluation procedure has been modified

If the UE supports MBMS and MBMS is active in the cell and the UE is permitted to receive MBMS services in the cell, the UE shall perform MBMS tasks as specified in subclause 6.3 of TS 25.304.

…

In the cell reselection process, an MBMS PL shall only be applicable while the UE is receiving an MBMS session from one or more of the ongoing activated MBMS services for which this PL is indicated.

…

The measurement rules below apply in Idle, URA_PCH, CELL_PCH states. In CELL_FACH state the UE is required to perform measurements on all intra-frequency, inter-frequency and inter-RAT cells listed in system information according to requirements specified in [10]. In Idle, URA_PCH, CELL_PCH and CELL_FACH states the UE shall only consider those cells the UE is mandated to measure according to the measurement rules below as measured cells in the cell reselection criteria (subclause 5.2.6.1.4).

If the system information broadcast in the serving cell indicates that HCS is used, then for intra-frequency and inter-frequency measurements, the UE shall:

use HCS priority$_1$ as the HCS priority broadcast in the system information and apply the following rule:

IF an MBMS PL is used THEN

- If the UE is in HCS low mobility state, for serving cell and neighbour cells belonging to the MBMS PL set the HCS priority = HCS priority$_1$ + HCS_OFF$_{mbms}$.

- If the UE is in HCS high mobility state, for serving cell and neighbour cells belonging to the MBMS PL set the HCS priority = HCS priority$_1$.

- for serving cell and neighbour cells not belonging to the MBMS PL, set the HCS priority = HCS priority$_1$.

IF an MBMS PL is not used THEN

For serving cell and all neighbour cells set HCS priority = HCS priority$_1$

…

The quality level threshold criterion H for hierarchical cell structures is used to determine whether prioritised ranking according to hierarchical cell re-selection rules shall apply, and is defined by:

$$H_s = Q_{meas,s} - Qhcs_s$$

$$H_n = Q_{meas,n} - Qhcs_n - TO_n * L_n$$

…

The cell-ranking criterion R is defined by:

$$R_s = Q_{meas,s} + Qhyst_s + Qoffmbms$$

$$R_n = Q_{meas,n} - Qoffset_{s,n} + Qoffmbms - TO_n * (1 - L_n)$$

where:

the signalled value Qoffmbms is only applied to those cells (serving or neighbouring) belonging to the MBMS PL

where:

$$TO_n = TEMP\_OFFSET_n * W(PENALTY\_TIME_n - T_n)$$

$$L_n = 0 \quad\quad\quad \text{if } HCS\_PRIO_n = HCS\_PRIO_s$$
$$L_n = 1 \quad\quad\quad \text{if } HCS\_PRIO_n <> HCS\_PRIO_s$$

$$W(x) = 0 \quad\quad \text{for } x < 0$$
$$W(x) = 1 \quad\quad \text{for } x >= 0$$

$TEMP\_OFFSET_n$ applies an offset to the H and R criteria for the duration of $PENALTY\_TIME_n$ after a timer $T_n$ has started for that neighbouring cell.

$TEMP\_OFFSET_n$ and $PENALTY\_TIME_n$ are only applicable if the usage of HCS is indicated in system information.

…

If HCS is used in the serving cell the UE shall perform ranking of all cells that fulfil the criterion S among

1.  when in low-mobility (see subclause 5.2.6.1.2),

    -   all measured cells, that have the highest HCS_PRIO among those cells that fulfil the criterion H >= 0.

    -   all measured cells, not considering HCS priority levels, if no cell fulfil the criterion H >= 0.

…

If the usage of HCS is indicated in system information, $TEMP\_OFFSET1_n$ is used for $TEMP\_OFFSET_n$ to calculate $TO_n$. If it is indicated in system information that HCS is not used, $TEMP\_OFFSET_n$ is not applied when calculating $R_n$. The best ranked cell is the cell with the highest R value.

…

If a TDD or GSM cell is ranked as the best cell, then the UE shall perform cell re-selection to that TDD or GSM cell

…

If an FDD cell is ranked as the best cell and the quality measure for cell selection and re-selection is set to CPICH RSCP, the UE shall perform cell re-selection to that FDD cell. If this cell is found to be not suitable, the UE shall behave according to subclause 5.2.6.1.3.

…

The cells shall be ranked according to the R criteria specified above, deriving $Q_{meas,n}$ and $Q_{meas,s}$ and calculating the R values using CPICH RSCP, P-CCPCH RSCP and the averaged received signal level as specified in [22] and [23] for FDD, TDD and GSM cells, respectively.

The offset $Qoffset1_{s,n}$ is used for $Qoffset_{s,n}$ to calculate $R_n$, the hysteresis $Qhyst1_s$ is used for $Qhyst_s$ to calculate $R_s$. For UE in RRC connected mode states CELL_PCH or URA_PCH the hysteresis $Qhyst_s$ takes the value $Qhyst1_{s,PCH}$ to calculate $R_s$, if provided in SIB4 [see 8]. For UE in RRC connected mode state CELL_FACH the hysteresis $Qhyst_s$ takes the value $Qhyst1_{s,FACH}$ to calculate $R_s$, if provided in SIB4 [see 8].

…

If an FDD cell is ranked as the best cell and the quality measure for cell selection and re-selection is set to CPICH RSCP, the UE shall perform cell re-selection to that FDD cell. If this cell is found to be not suitable, the UE shall behave according to subclause 5.2.6.1.3 of TS 25.304.

…

In all cases, the UE shall reselect the new cell, only if the following conditions are met:

- the new cell is better ranked than the serving cell during a time interval Treselection. For UE in RRC connected mode states CELL_PCH or URA_PCH the interval $Treselection_{s,PCH}$ applies, if provided in SIB4 [see 8], while for UE in RRC connected mode state CELL_FACH the interval $Treselection_{s,FACH}$ applies, if provided in SIB4 [see 8]. For hierarchical cell structures when high mobility state has not been detected, if according to the HCS rules the serving cell is not ranked then all the ranked cells are considered to be better ranked than the serving cell.

...

The UE shall perform the MBMS frequency layer selection procedure upon receiving the IE "MBMS Preferred frequency information", when specified explicitly e.g. as in subclause 8.6.9.2, or when the priority for an MBMS service as indicated by upper layers changes.

The UE shall:

1> if there exist two or more preferred frequencies for services included in variable MBMS_ACTIVATED_SERVICES:

2> request from upper layers the priorities of the different MBMS services included in variable MBMS_ACTIVATED_SERVICES for which a preferred frequency has been received.

1> if the UE is in idle mode:

2> if a preferred frequency layer applies for a service included in variable MBMS_ACTIVATED_SERVICES:

3> select the preferred frequency indicated for the MBMS service(s) prioritised most by upper layers for which a preferred frequency exists as the preferred frequency.

Reference

3GPP TS 25.304 clauses 5.2.5.1, 5.2.6.1.0, 5.2.6.1.2, 5.2.6.1.4.

3GPP TS 25.331 clause 8.5.27.

### 8.5.6.4.3          Test purpose

1. To verify that a UE in idle mode ranks cells based on both HCS priority and R. Qhyst, Qoffset and PENALTY TIME are not applied so R equals CPICH_RSCP.

2. To verify that a UE in idle mode performs a Serving Cell Reselection to the Preferred Layer at Session Start.

3. To verify that a UE in idle mode performs an intra-frequency Cell Reselection on the Preferred Layer during an ongoing Session

### 8.5.6.4.4          Method of test

Initial Condition

System Simulator: 3 MBMS cells (Cell 21, Cell 24, Cell 26) with the downlink transmission power shown in column marked "T0" in table 8.5.6.4-1.

SS shall indicate in System Information that HCS is in use. Qhcs = 0 so all cells fulfil the criterion H >=0.

Each cell shall include the other cells as neighbouring cells in System Information Block Type 11.

UE:

The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Specific message contents for System information blocks 3 and 11 are used in Cell 21.

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

Test procedure

Table 8.5.6.4-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while columns marked "T1 are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.5.6.4-1**

| Parameter | Unit | Cell 21 | | Cell 24 | | Cell 26 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | | High Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | -60 | -60 | -75 | -75 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -60 | -60 | -75 | -75 | -60 |
| HCS_PRIO | | 5 | | 3 | | 3 | |

Method C is applied (as described and used in clause 6 of TS 34.123-1).

The SS activates Cell 21, Cell 24 and Cell 26 and monitors them for access request from the UE. The UE is in idle mode state on Cell 21.The UE receives at notification via MCCH, an MBMS MODIFIED SERVICES INFORMATION message including a preferred frequency in the IE "MBMS preferred frequency". The HCS_OFFmbms is added to the normal HCS priority level of cells on this MBMS preferred frequency. Cell 24 and Cell 26 have the highest priority.

The UE shall consider this frequency as the preferred frequency layer for cell re-selection. The SS waits for random access requests from the UE. The UE moves to Cell 24 at session start for the concerned MBMS service. The UE shall store the frequency information of the frequency on which the UE was operating prior to cell-reselection to the preferred frequency in the variable MBMS_PREV_FREQUENCY_INFORMATION.

The HCS_OFFmbms is added to the normal HCS priority level of cells on this MBMS preferred frequency. Cell 24 and Cell 26 have the highest priority.

The SS transmits an MBMS MODIFIED SERVICE INFORMATION message which includes in the "Modified service list" for the MBMS activated service "MBMS required UE action" set to "Acquire counting info" and MBMS ACCESS INFORMATION message, which includes the MBMS Short Transmission ID associated to the MBMS activated service and "Access probability factor – Idle" set to 0 (corresponds to an actual Probability Factor = 1).

The UE shall transmit an RRC CONNECTION REQUEST message, with "Establishment cause" set to "MBMS reception". The SS transmits a RRC CONNECTION SETUP. The UE establishes an RRC connection and transmits an RRC CONNECTION SETUP COMPLETE message.

The UE receives an MBMS MODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to "Acquire PTM RB info". The UE receives an MBMS NEIGHBOURING CELL P-T-M RB INFORMATION including MBMS neighbouring cell information for Cell 26. The UE shall apply the MBMS p-t-m radio bearer configuration procedure to acquire the radio bearer configuration for the MBMS service provided by the SS.

The UE starts receiving the indicated p-t-m radio bearer.

The SS applies the power settings of "T1" in table 8.5.6.4-1. The SS waits for random access requests from the UE. The UE shall reselect to Cell 26.

The UE receives an MBMS UNMODIFIED SERVICES INFORMATION message "MBMS required UE action" IE set to "Acquire PTM RB info". The UE receives an MBMS NEIGHBOURING CELL P-T-M RB INFORMATION including MBMS neighbouring cell information for Cell 24. The UE shall apply the MBMS p-t-m radio bearer configuration and continues receiving the indicated p-t-m radio bearer.

SS calls for generic procedure C.1 to check that UE is in idle mode.

Expected sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| 1 | UE | | | The UE is in idle mode on Cell 21. |
| 2 | ← | | SYSTEM INFORMATION | SS indicates that HCS is used. |
| 3 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "none" and the "MBMS preferred frequency" IE indicates the reference to Ch. 2. |
| 4 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information is set to Ch. 2. |
| 5 | | | | The SS waits for random access requests from the UE. The UE shall responds on Cell 24. |
| 6 | ← | | MBMS MODIFIED SERVICES INFORMATION | "MBMS required UE action" IE is set to "Acquire counting info" |
| 7 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 8 | ← | | MBMS ACCESS INFORMATION | "MBMS short transmission ID" IE set to 1, "Access probability factor – Idle" set to 0 (corresponding to the actual probability factor value 1). |
| 9 | → | | RRC CONNECTION REQUEST | Establishment cause set to MBMS reception. |
| 10 | ← | | RRC CONNECTION SETUP | |
| 11 | → | | RRC CONNECTION SETUP COMPLETE | |
| 11a | → | | MBMS MODIFICATION REQUEST | The UE completing the RRC connection Setup procedure shall initiate the MBMS MODIFICATION REQUEST procedure in case of MBMS selected Service. This message may be received at any point after step 11 and before step 13. |
| 12 | UE | | | UE transmits SERVICE REQUEST, with IE "Service type" set to "MBMS Broadcast service Reception". |
| 13 | ← | | RRC CONNECTION RELEASE | |
| 14 | → | | RRC CONNECTION RELEASE COMPLETE | The UE shall enter idle state. |
| 15 | ← | | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. |
| 16 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |
| 17 | ← | | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 26 |
| 18 | | SS | | The SS applies the power settings of "T1" in Table 8.5.6.4-1 |
| 19 | UE | | | The SS waits for random access requests from the UE. The UE shall responds on Cell 26. |
| 20 | ← | | MBMS UNMODIFIED SERVICES INFORMATION | There is no change in MBMS services already ongoing in previous cell |
| 21 | ← | | MBMS GENERAL INFORMATION | MBMS preferred frequency information set without index into SIB11 neighbour list. |

| 22 | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 24 |
|----|-----|------|------|
| 23 | ←→ | CALL C.1 | If the test result of C.1 indicates that UE is in idle mode, the test passes, otherwise it fails. |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 3 (Step 2)

| Information Element | Value/remark |
|---------------------|--------------|
| Sintersearch | Not Present |

MBMS MODIFIED SERVICES INFORMATION (Step 3)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 Entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | None |
| - MBMS preferred frequency | |
|   - PFL index | Index for Ch 2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |
| - Continue MCCH reading | FALSE |

MBMS GENERAL INFORMATION (Step 4)

| Information Element | Value/remark |
|---------------------|--------------|
| MBMS preferred frequency information | |
| - MBMS preferred frequency list | Only 1 Entry |
|  - MBMS preferred frequency | Ch 2 (the frequency that UEs shall consider as the preferred frequency layer for cell re-selection during a session for an MBMS service the UE has activated) |
|  - CHOICE Layer convergence information | |
|   - HCS | |
|    - HCS_OFFmbms | 4 (Offset added to the normal HCS priority level of cells on this MBMS preferred frequency) |
| - MBMS PL Service Restriction Information | TRUE |

MBMS MODIFIED SERVICES INFORMATION (Step 6)

| Information Element | Value/remark |
|---------------------|--------------|
| Modified service list | Only 1 entry |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire counting info |
| - Continue MCCH reading | FALSE |

MBMS MODIFIED SERVICES INFORMATION (Step 15)

| Information Element | Value/remark |
|---------------------|--------------|
| Message type | |
| Modified service list | |
|   - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
|   - MBMS required UE action | Acquire PTM RB info |
| MBMS p-t-m activation time | Set to the first TTI of the next modification period |

MBMS UNMODIFIED SERVICES INFORMATION (Step 20)

| Information Element | Value/remark |
|---|---|
| Message type | |
| Unmodified service list | |
|   - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
|   - MBMS required UE action | Acquire PTM RB info |

### 8.5.6.4.5 Test requirement

At step 5, the UE shall respond on Cell 24.

At step 15, the UE shall respond on Cell 26.

## 8.5.6.4m MBMS Controlling Cell Change - Idle mode - Frequency Layer Convergence – With HCS / MBMS Multicast Service

### 8.5.6.4m.1 Definition

This test is applicable for all UEs that support MBMS multicast services.

### 8.5.6.4m.2 Conformance requirement

Same conformance requirement as in clause 8.5.6.4.2

### 8.5.6.4m.3 Test purpose

Same test purpose as in clause 8.5.6.4.3.

### 8.5.6.4m.4 Method of test

Initial condition

System Simulator:

      3 MBMS cells, Cell 21, Cell 24, Cell 26.

User Equipment:

      The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

      The UE has joined the multicast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

    - MBMS Multicast service application available on UE       Yes/No.

Test procedure

Same test procedure as in clause 8.5.6.4.4, except that at step 12 UE transmits Service Request, with IE "Service type" set to "MBMS Multicast service Reception".

Specific message contents

Same specific messages contents as in clause 8.5.6.4.4

### 8.5.6.4m.5 Test requirements

Same test requirement as in clause 8.5.6.4.5.

### 8.5.6.5 MBMS Controlling Cell Change in CELL_DCH during ongoing session / MBMS Broadcast Service

#### 8.5.6.5.1 Definition and applicability

This test case is applicable for all UEs that support MBMS broadcast services and support MBMS p-t-m reception in CELL_DCH state.

#### 8.5.6.5.2 Conformance requirement

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3 of TS 25.331.

The UE shall immediately acquire the MBMS ACCESS INFORMATION and the MBMS GENERAL INFORMATION messages i.e. it shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION and MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

Reference

3GPP TS 25.331 clause 8.7.2.3.

#### 8.5.6.5.3 Test purpose

1. To verify that a UE in CELL_DCH state performs an inter-frequency MBMS Controlling Cell Change during an ongoing Session.

2. To verify that a UE in CELL_DCH state performs an intra-frequency MBMS Controlling Cell Change during an ongoing Session.

3. To verify that a UE in CELL_DCH is able to apply MBMS NEIGHBOURING CELLS P-T-M RB INFORMATION and receive data on this p-t-m radio bearer.

#### 8.5.6.5.4 Method of test

Initial Condition

System Simulator:

   3 MBMS cells, Cell 21, Cell 24 and Cell 26.

User Equipment:

   The UE is in CELL_DCH state as specified in clause 7.6 of TS 34.108.

   The UE is interested in the broadcast service to be provided by the SS (included in MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statement(s)

- MBMS Broadcast service application available on UE    Yes/No

- UE supports MBMS p-t-m reception in CELL_DCH state    Yes/No

Test Procedure

Table 8.5.6.5-1 illustrates the downlink power to be applied for the 3 cells in this test case. Initially, the SS applies the power settings of column "T0".

**Table 8.5.6.5-1**

| Parameter | Unit | Cell 21 | | | Cell 24 | | | Cell 26 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T0 | T1 | T2 | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | High Range Test Frequency | | | High Range Test Frequency | | |
| CPICH Ec ( FDD ) | dBm/3.84 MHz | -60 | -80 | -80 | -70 | -60 | -70 | -70 | -70 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -80 | -80 | -70 | -60 | -70 | -70 | -70 | -60 |

The UE is in the CELL_DCH state in Cell 21. The SS notifies on MICH and MCCH about the start of an MBMS session and waits for the UE to activate MTCH reception. The MBMS radio bearer on MTCH is put into loopback mode 3.

The SS sends 10 RLC SDUs of MBMS data on MTCH in Cell 21 on the concerned MBMS radio bearer. The retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the UE has received at least one RLC SDU.

The SS applies the power settings of "T1" in table 8.5.6.5-1 and orders an inter-frequency hard handover to Cell 24 by transmitting a PHYSICAL CHANNEL RECONFIGURATION message. The UE establishes the dedicated physical channel in Cell 24 and replies with a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message, and waits for the UE to activate MTCH reception.

The SS provides information about the ongoing MBMS services in cell 24 by sending MBMS UNMODIFIED SERVICES INFORMATION. The SS informs the UE about Cell 26 as neighbouring cell by sending MBMS NEIGHBOURING CELL P-T-M RB INFORMATION in Cell 24.

The SS sends 10 RLC SDUs of MBMS data in cell 24. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than zero.

The SS then sends 10 RLC SDUs of MBMS data in neighbouring cell 26 and SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. UE should be able to receive the MBMS data from neighbouring Cell 26 when camped in Cell 24. The SS checks that the reported number is greater than the number reported by the UE at step 16 of expected sequence. The SS applies the power settings of "T2" in table 8.5.6.5-1 and then orders handover to Cell 26 by transmitting a PHYSICAL CHANNEL RECONFIGURATION message. The UE establishes the dedicated physical channel in Cell 26 and replies with a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message.

The SS provides information about the ongoing MBMS service in cell 26 by sending MBMS UNMODIFIED SERVICES INFORMATION. The SS informs the UE about Cell 24 as neighbouring cell by sending MBMS NEIGHBOURING CELL P-T-M RB INFORMATION in Cell 24.

The SS sends 10 RLC SDUs of MBMS data in cell 26. The SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the number reported by the UE at step 19.

The SS then sends 10 RLC SDUs of MBMS data in neighbouring cell 24 and SS retrieves the number of RLC SDUs on MTCH counted by the UE by sending the UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST message. The SS checks that the reported number is greater than the previous number reported by the UE at step 27.

The loopback mode 3 in the UE is deactivated.

SS calls for generic procedure C.3 to check that UE is in CELL_DCH state.

   NOTE:    If the UE fails the test because of selecting the wrong cell, the operator may re-run the test.

Expected sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | ← | ACTIVATE RB TEST MODE | |
| 2 | → | | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | | ← | MBMS MODIFIED SERVICES INFORMATION | MBMS session start. The SS also sets the Notification Indicator on MICH. The SS waits for the UE to establish the MTCH. |
| 4 | | ← | CLOSE UE TEST LOOP | |
| 5 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 6 | SS | | | The SS broadcasts 10 RLC SDUs of MBMS data in Cell 21. |
| 7 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 8 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data in Cell 21. The SS checks that the number of reported RLC PDUs is greater than zero and record the value. |
| 9 | SS | | | The SS applies the power settings of "T1" in table 8.5.6.5-1. |
| 10 | | | PHYSICAL CHANNEL RECONFIGURATION | Inter-frequency hard handover to Cell 24. |
| 11 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The SS waits for the UE to establish the MTCH according to the messages in steps 12-13 |
| 12 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | There is no change in MBMS services already ongoing in previous cell |
| 13 | | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 26 |
| 13a | | ← | CLOSE UE TEST LOOP | |
| 13b | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 14 | SS | | | The SS transmits 10 RLC SDUs of MBMS data in Cell 24. |
| 15 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 16 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data also in Cell 24. The SS checks that the number of reported RLC PDUs is greater than 0. |
| 17 | SS | | | SS transmits 10 RLC SDUs of MBMS data in Cell 26. |
| 18 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 19 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data sent in neighbouring cell 26. The SS checks that the number of reported RLC PDUs is greater than the value at step 16. |
| 20 | SS | | | The SS applies the power settings of "T2" in table 8.5.6.5-1 |
| 21 | | | PHYSICAL CHANNEL RECONFIGURATION | UE moves to Cell 26. |
| 22 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | |

| 23 | ← | MBMS UNMODIFIED SERVICES INFORMATION | There is no change in MBMS services already ongoing in previous cell |
|----|---|---|---|
| 24 | ← | MBMS NEIGHBOURING CELL P-T-M RB INFORMATION | This message has info for neighbouring cell 24 |
| 25 | SS | | SS transmits 10 RLC SDUs of MBMS data in Cell 26. |
| 26 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 27 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data also in Cell 26. The SS checks that the number of reported RLC PDUs is greater than the value at step 19. |
| 28 | SS | | SS transmits 10 RLC SDUs of MBMS data in Cell 24. |
| 29 | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 30 | → | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the UE has received MBMS data sent in neighbouring cell 24. The SS checks that the number of reported RLC PDUs is greater than the value at step 27. |
| 31 | ← | OPEN UE TEST LOOP | |
| 32 | → | OPEN UE TEST LOOP COMPLETE | |
| 33 | ←→ | CALL C.3 | If the test result of C.3 indicates that UE is in CELL_DCH state, the test passes, otherwise it fails. |

Specific Message Contents

PHYSICAL CHANNEL RECONFIGURATION (Step 10) (FDD)

Use the same message as specified for "Packet to CELL_DCH from CELL_DCH in PS" in 34.108 except for the following:

| Information Element | Value/remark |
|---|---|
| Frequency info | |
|   - UARFCN uplink(Nu) | Not present |
| | Absence of this IE is equivalent to applying the default duplex distance defined for the operating frequency according to 3GPP TS 25.101 [21] |
|   - UARFCN downlink(Nd) | Same downlink UARFCN as used for Cell 24 |
| Downlink information common for all radio links | |
|   - Downlink DPCH info common for all RL | |
|     - Timing indication | Initialise |
|   - Default DPCH Offset Value | Arbitrary set to value 0..306688 by step of 512 |
| Downlink information per radio link list | 1 radio link |
|   Downlink information for each radio link | |
|    - CHOICE mode | FDD |
|     - Primary CPICH info | |
|      - Primary scrambling code | Set to the scrambling code for Cell 24 |

PHYSICAL CHANNEL RECONFIGURATION (Step 10) (1.28Mcps and 7.68Mcps TDD)

Use the same message as specified for "Packet to CELL_DCH from CELL_DCH in PS" in 34.108 except for the following:

| Information Element | Value/remark |
|---|---|
| Frequency info | |
|   - UARFCN (Nt) | Same UARFCN as used for cell 24 |
| CHOICE channel requirement | Not present |
| Downlink information common for all radio links | |
|   - Downlink DPCH info common for all RL | |
|     - Timing indication | Initialise |
|     - CFN-targetSFN frame offset | 0 |
|     - Downlink DPCH power control information | Not Present |
|     - MAC-d HFN initial value | Not Present |
|     - CHOICE mode | TDD |
|   - CHOICE mode | TDD |
|     - CHOICE TDD option | 1.28 Mcps TDD |
|       - TSTD indicator | FALSE |
|   - Default DPCH Offset Value | Arbitrary set to value 0..306688 by step of 512 |
|     - CHOICE mode | TDD |
|     - Default DPCH Offset Value | 0 Integer(0..7) |
|   - MAC-hs reset indicator | FALSE |
| Downlink information per radio link list | 1 radio link |
|   Downlink information for each radio link | |
|     - CHOICE mode | TDD |
|     - Primary CCPCH info | Set to the Cell parameters ID for cell 4 |
|     - Downlink DPCH info for each RL | |
|       - CHOICE mode | TDD |
|       - TFCS ID | Reference to TS34.108 clause 6.11 Parameter Set |
|       - Time info | Reference to TS34.108 clause 6.11 Parameter Set |
|       - Common timeslot info | Reference to TS34.108 clause 6.11 Parameter Set |
|       - Downlink DPCH timeslots and codes | as used for cell 4 |

PHYSICAL CHANNEL RECONFIGURATION (Step 10) (3.84Mcps TDD)

Use the same message as specified for "Packet to CELL_DCH from CELL_DCH in PS" in 34.108 except for the following:

| Information Element | Value/remark |
|---|---|
| Frequency info | |
|   - UARFCN (Nt) | Same UARFCN as used for cell 4 |
| CHOICE channel requirement | Not present |
| Downlink information common for all radio links | |
|   - Downlink DPCH info common for all RL | |
|     - Timing indication | Initialise |
|     - CFN-targetSFN frame offset | 0 |
|     - Downlink DPCH power control information | Not Present |
|     - Downlink rate matching restriction information | Not Present |
|     - Spreading factor | Reference to TS34.108 clause 6.10 Parameter Set |
|     - Fixed or flexible position | Reference to TS34.108 clause 6.10 Parameter Set |
|     - TFCI existence | Reference to TS34.108 clause 6.10 Parameter Set |
|     - CHOICE SF | Reference to TS34.108 clause 6.10 Parameter Set |
|   - DPCH compressed mode info | Not present |
|   - TX Diversity mode | Not Present |
|   - SSDT information | Not Present |
|   - Default DPCH Offset Value | Arbitrary set to value 0..306688 by step of 512 |
|   - MAC-hs reset indicator | FALSE |
| Downlink information per radio link list | 1 radio link |
|   Downlink information for each radio link | |
|     - CHOICE mode | TDD |
|     - Primary CCPCH info | Set to the Cell parameters ID for cell 4 |
|     - Downlink DPCH info for each RL | |
|       - CHOICE mode | TDD |
|       - TFCS ID | Reference to TS34.108 clause 6.10 Parameter Set |
|       - Time info | Reference to TS34.108 clause 6.10 Parameter Set |
|       - Common timeslot info | Reference to TS34.108 clause 6.10 Parameter Set |
|       - Downlink DPCH timeslots and codes | as used for cell 4 |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 8)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 16,19,27,30 )

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than the value reported at the previous sub-test. |

PHYSICAL CHANNEL RECONFIGURATION (Step 21) (FDD)

Use the same message as specified for "Packet to CELL_DCH from CELL_DCH in PS" in 34.108 except for the following:

| Information Element | Value/remark |
|---|---|
| Frequency info | |
|    - UARFCN uplink(Nu) | Not present |
| | Absence of this IE is equivalent to applying the default duplex distance defined for the operating frequency according to 3GPP TS 25.101 [21] |
|    - UARFCN downlink(Nd) | Same downlink UARFCN as used for Cell 26 |
| Downlink information common for all radio links | |
|    - Downlink DPCH info common for all RL | |
|      - Timing indication | Initialise |
|    - Default DPCH Offset Value | Arbitrary set to value 0..306688 by step of 512 |
| Downlink information per radio link list | 1 radio link |
|    Downlink information for each radio link | |
|      - CHOICE mode | FDD |
|        - Primary CPICH info | |
|          - Primary scrambling code | Set to the scrambling code for Cell 26 |

#### 8.5.6.5.5 Test requirement

After step 7, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero.

After step 10, the UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message in Cell 24.

After step 15, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than zero

After step 18, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 16.

After step 26, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 19.

After step 29, the UE shall transmit a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message with the number of reported RLC SDUs shall be greater than the number reported in step 27.

### 8.5.6.5m MBMS Controlling Cell Change in CELL_DCH during ongoing session / MBMS Multicast Service

#### 8.5.6.5m.1 Definition

This test is applicable for all UEs that support MBMS multicast services and support MBMS p-t-m reception in CELL_DCH state.

#### 8.5.6.5m.2 Conformance requirement

Same conformance requirement as in clause 8.5.6.5.2

**8.5.6.5m.3          Test purpose**

Same test purpose as in clause 8.5.6.5.3.

**8.5.6.5m.4          Method of test**

Initial condition

System Simulator:

    2 MBMS cells, Cell 21 and Cell 24.

User Equipment:

    The UE is in Idle Mode as specified in clause 7.6 of TS 34.108.

    The UE has joined the multicast service to be provided by the SS (included in
    MBMS_ACTIVATED_SERVICES variable).

Related ICS/IXIT statements

-    MBMS Multicast service application available on UE          Yes/No.

-    UE supports MBMS p-t-m reception in CELL_DCH state     Yes/No

Test procedure

Same test procedure as in clause 8.5.6.5.4.

Specific message contents

Same specific messages contents as in clause 8.5.6.5.4

**8.5.6.5m.5          Test requirements**

Same test requirement as in clause 8.5.6.5.5.


# 8.5.7     MBSFN Specific Procedures (FDD/TDD)

## 8.5.7.1          Cell Update: cell reselection in CELL_PCH (unicast carrier) during ongoing MBMS session in MBSFN mode

### 8.5.7.1.1          Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.7.1.2          Conformance requirement

The UE reception of MBMS services provided in MBSFN mode shall not affect the UE behaviour on the unicast carrier. Especially the UE mobility on the unicast carrier is not affected by the reception of MBMS services provided on a cell operating in MBSFN mode and can imply that the reception of the MBMS service on the cell operating in MBSFN mode is impossible due to the limited support of combination of frequency bands for MBMS SFN reception and unicast reception.

…

A UE that is capable of receiving MBMS services on cells operating in MBSFN mode as specified in subclause 8.1.1.6.3 is operating in idle mode and acts on RRC messages and system information received from this cell operating in MBSFN mode independently from messages received from cells not operating in MBSFN mode. This implies that procedures executed based on messages and system information received from a cell operating in MBSFN mode shall not interact with messages and system information received from a cell not operating in MBSFN mode unless explicitly specified otherwise.

NOTE 1:   This implies that the UE is operating an independent stack for the reception of MBMS services on cells operating in MBSFN mode as specified in subclause 8.1.1.6.3.

NOTE 2:   For 1.28 Mcps TDD, if the cell is operating in MBSFN mode, system information and MCCH messages are transmitted on the MBSFN Special Timeslot [30].

…

A cell provides MBMS service in MBSFN mode if it is indicated so in system information, see subclause 8.1.1.6.3. A UE that supports MBSFN operation may receive MBMS services via a cell operating in MBSFN mode. For FDD, 3.84 Mcps TDD IMB and 3.84/7.68 Mcps TDD in order to receive an MBMS service via a MBSFN cluster the UE shall select the MBSFN cluster as specified in [4] in addition to selecting a cell for normal camping as specified in [4]. For 1.28 Mcps TDD in order to receive an MBMS service via an MBSFN cluster the UE shall at the first step camp on a unicast cell and get the frequency and "cell parameter ID" from the system information, and then get synchronized to the MBSFN cluster operating with that frequency and "cell parameter ID". For 3.84/7.68 Mcps TDD a cell shall be considered to be operating in MBSFN mode when individual scrambling codes are assigned to all timeslots (via the IE "TDD MBSFN Information").

…

Reference

3GPP TS 25.346 clauses 7.1A.

3GPP TS 25.331 clauses 7.2.1, 8.5.43.

### 8.5.7.1.3          Test purpose

To verify that the UE will perform a Cell Update on the unicast carrier while receiving an ongoing MBMS service via a p-t-m radio bearer on the MBSFN cluster.

### 8.5.7.1.4          Method of test

Initial condition

System Simulator:

-   MBSFN carrier: 1 cell, Cell 31 (PLMN1). In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default1 MCCH scheduling (No ongoing session) according to subclause 11.2 of TS 34.108.

-   Unicast carrier : 2 cells, Cell 1 and Cell 2 with default parameters.

User Equipment:

-   On the unicast carrier the UE is in CELL_PCH (state 6-12) in Cell 1 as specified in clause 7.4 of TS 34.108.

-   The UE is in MBSFN Idle mode with one activated service as specified in clause 7.6.4 of TS 34.108. The UE has selected (i.e. it is included in MBMS_ACTIVATED_SERVICES variable) a national service for which a session will start on MBSFN Cell 31 (see TS 34.108 clause 11.2.4) during the test.

Related ICS/IXIT statements

-   MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

-   Support of transmit and receive functions available on UE    Yes/No.

-   Support of MBSFN receive only function available on UE    Yes/No.

Test procedure

The SS shall apply the downlink power settings as shown below:

Step 1-13:

| Parameter | Unit | Cell 1 | Cell 2 | Cell 31 |
|---|---|---|---|---|
| UTRA RF Channel Number | | Ch. 1 | Ch. 1 | Ch. 2 |
| P-CCPCH RSCP | dBm | -60 | -69 | -60 |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -60 |
| P-CPICH (IMB) | dBm/3.84MHz | | | -60 |
| T-CPICH (IMB) | dBm/3.84MHz | | | -50.5 |

Step 14-25:

| Parameter | Unit | Cell 1 | Cell 2 | Cell 31 |
|---|---|---|---|---|
| UTRA RF Channel Number | | Ch. 1 | Ch. 1 | Ch. 2 |
| P-CCPCH RSCP | dBm | -69 | -60 | -60 |
| CPICH Ec (FDD) | dBm/3.84MHz | -69 | -60 | -60 |
| P-CPICH (IMB) | dBm/3.84MHz | | | -60 |
| T-CPICH (IMB) | dBm/3.84MHz | | | -50.5 |

a)  The UE is camping on Cell 1 and Cell 31. For 3.84 Mcps TDD IMB, the UE is camping on the FDD unicast carrier cell 1 and IMB cell 31. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 (no session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

b)  The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE.

c)  The SS sends CLOSE UE TEST LOOP to activate RLC SDU counting on Cell 31 MTCH (Transmission identity indicating the MBMS activated service).

d)  The SS notifies on MCCH about the start of an MBMS session for one modification period. MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C4 (one PTM session starting) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

e)  MCCH messages are then transmitted by the SS on Cell 31 using MBMS configuration C2 (one PTM session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

f)  The UE establishes the p-t-m radio bearer for the activated service according to the specified service activation time (i.e. the first SFN of the modification period following the notification (step d). The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

g)  The SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for the activated service. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB).

h)  The SS shall then send UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST. The UE shall respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0. The SS shall store the counter value.

i)  The SS adjusts the power settings for Cell 1 and Cell 2. When the UE detects the presence of cell 2, it moves to CELL_FACH state and transmits a CELL UPDATE message on the uplink CCCH. The value "cell reselection" shall be set in IE "Cell update cause" in CELL UPDATE message.

j)  Upon reception of the CELL_UPDATE message, the SS replies with a CELL UPDATE CONFIRM message with the IE "RRC State Indicator" set to "CELL_PCH". After receiving this message, the UE returns to CELL_PCH state without transmitting any uplink message.

k)  The SS calls for generic procedure C.4 to check that the UE is in CELL_PCH state.

l)  The SS broadcasts 10 RLC SDUs on the MTCH configured on the MBSFN MBMS p-t-m radio bearer for the activated service.

m) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE corresponds to > 0 received RLC SDUs.

NOTE: If the UE fails the test because of a failure to reselect to the right unicarrier cell (Cell 2), then the operator may re-run the test.

Expected sequence

| Step | Direction | | Carrier | Message | Comment |
|---|---|---|---|---|---|
| | UE | SS | | | |
| 1 | ← | | U | ACTIVATE RB TEST MODE | |
| 2 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated on Cell 31 for the selected local service on MTCH. |
| 4 | ← | | M | MBMS MCCH Message Configuration C4 | Includes the national service activated at UE in the modified services list for one modification period. |
| 5 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. One ongoing service corresponding to that activated at the UE 129.6(FDD) or 124(TDD) kbps PS RAB, 124.4 kbps (IMB) |
| 6 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer and close the test loop. |
| 7 | | SS | M | | After delaying for a period equal to the MCCH modification period, the SS transmits 10 RLC SDUs on the MTCH. |
| 8 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 9 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. SS stores value. |
| 10 | | | U | | The SS transmits 10 RLC SDUs on the MTCH starting at the indicated activation time. |
| 11 | → | | U | CELL UPDATE | The UE moves to CELL_FACH state and transmits this message with the IE "Cell update cause" set to "cell reselection" |
| 12 | ← | | U | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_PCH". |
| 13 | UE | | U | | The UE is in CELL_PCH state. |
| 14 | ← → | | U | CALL C.4 | If the test result of C.4 indicates that UE is in CELL_PCH state, the test passes, otherwise it fails. |
| 15 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH. |
| 16 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 17 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 18 | ← | | U | OPEN UE TEST LOOP | |
| 19 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 20 | ← | | U | DEACTIVATE RB TEST MODE | |
| 21 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

With the following exceptions, all messages have the same content as defined in TS 34.108 clause 9.1.3 for the MBSFN carriers and in TS 34.108 clause 9.1.1 or 9.1.2 for the unicast carrier:

CELL UPDATE (Step 11)

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
| - SRNC Identity | Check to see if set to '0000 0000 0001' |
| - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| Cell Update Cause | Check to see if set to 'Cell Re-selection' |

CELL UPDATE CONFIRM (Step 162)

| Information Element | Value/remark |
|---|---|
| RRC State Indicator | CELL_PCH |
| UTRAN DRX cycle length coefficient | 3 |

### 8.5.7.1.5 Test requirements

1) After step 9, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a number > 0 for Cell 31 MTCH.

3) After step 11, the UE shall reselect to Cell 2 and transmit a CELL UPDATE message, containing the IE "Cell update cause" set to "cell reselection".

4) After step 13, the UE shall enter CELL_PCH state.

5) After step 17, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a number > 0 for Cell 31 MTCH.

## 8.5.7.2 Re-acquire MCCH - modified MBSFN inter frequency neighbour list / All MBSFN services notified

### 8.5.7.2.1 Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.7.2.2 Conformance requirement

Upon receiving the MBMS GENERAL INFORMATION message, the UE should store all relevant IEs included in this message. The UE shall also:

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following.

…

For FDD 3.84 Mcps TDD IMB and 3.84/7.68 Mcps TDD if the IE "MBSFN inter frequency neighbour list" is included and the UE does not receive a service from this MBSFN cluster, the UE shall:

1> consider that MBMS services transmitted in MBSFN mode are available on these frequencies;

…

1> if at least one frequency is listed for which "MBSFN services not notified" is indicated in the IE "MBSFN inter frequency neighbour list":

2> if the IE "All MBSFN services notified" is included for one frequency as defined in [21] for FDD and [22] for TDD on which the UE supports reception in MBSFN mode:

3> attempt to receive notifications on one of the frequencies for which the IE "All MBSFN services notified" is included according to subclause 8.7.3.

…

Upon receiving the MBMS MODIFIED SERVICES INFORMATION message, the UE shall act as follows for each of the services included in this messages provided that the service is included in variable MBMS_ACTIVATED_SERVICES and upper layers indicate that the session has not yet been received correctly (referred to as 'applicable services'):

…

> 1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following

…

If the UE receives the IE " MBMS re-acquire MCCH", the UE shall:

> 1> perform the MCCH acquisition procedure as specified in subclause 8.7.2.

Reference

3GPP TS 25.331 clauses 8.7.2.5, 8.6.9.9ad, 8.7.3.4, 8.6.9.6a.

### 8.5.7.2.3 Test purpose

1. To verify that the UE correctly re-acquires the MCCH information when the UE receives the IE MBMS re-acquire MCCH in a received MBMS MODIFIED SERVICES INFORMATION message.

2. To verify that the UE acts upon the modified IE MBSFN inter frequency neighbour list received in the re-acquired MBMS GENERAL INFORMATION message when a service not received on the current MBSFN cluster is present in the variable MBMS_ACTIVATED_SERVICES.

3. To verify that the UE attempts to receive notifications, for the service not received on the current MBSFN cluster, on one of the frequencies for which the IE "All MBSFN services notified" is included.

### 8.5.7.2.4 Method of test

Initial condition

System Simulator:

- MBSFN carrier: 3 cells, Cell 31, Cell 36 and Cell 38 (all PLMN1). Cell 36 and Cell 38 are powered off. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default1 MCCH scheduling (No ongoing session) according to subclause 11.2 of TS 34.108.

    Unicast carrier: 1 cell, Cell 1 (PLMN1) default configuration.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with no activated service as specified in clause 7.6.3 of TS 34.108.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

- Support of transmit and receive functions available on UE   Yes/No.

- Support of MBSFN receive only function available on UE   Yes/No.

Test procedure

The SS shall apply the downlink power settings as shown below:

Step 1-7:

| Parameter | Unit | Cell 1 | Cell 31 | Cell 33 | Cell 36 |
|---|---|---|---|---|---|
| UTRA RF Channel Number | | Ch. 1 | Ch. 2 | Ch. 3 | Ch. 4 |
| P-CCPCH RSCP | dBm | -60 | -60 | OFF | OFF |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -60 | OFF | OFF |
| P-CPICH (IMB) | dBm/3.84MHz | | -60 | OFF | OFF |
| T-CPICH (IMB) | dBm/3.84MHz | | -50.5 | OFF | OFF |

Step 8-33:

| Parameter | Unit | Cell 1 | Cell 31 | Cell 33 | Cell 36 |
|---|---|---|---|---|---|
| UTRA RF Channel Number | | Ch. 1 | Ch. 2 | Ch. 3 | Ch. 4 |
| P-CCPCH RSCP | dBm | -60 | -60 | -60 | -70 |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -60 | -60 | -70 |
| P-CPICH (IMB) | dBm/3.84MHz | | -60 | -60 | -70 |
| T-CPICH (IMB) | dBm/3.84MHz | | -50.5 | -50.5 | -60.5 |

a)  The UE is camping on Cell 1 and Cell 31. For 3.84 Mcps TDD IMB, the UE is camping on the FDD unicast carrier cell 1 and IMB cell 31. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 (no session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108. Note: The IE "MBSFN inter frequency neighbour list" is not present in MBMS GENERAL INFORMATION.

b)  The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE.

c)  The SS sends CLOSE UE TEST LOOP to activate RLC SDU counting on MTCH. The Short Transmission identity is set to value "0" corresponding to National Service 5 (see TS 34.108 clause 11.2.4) on either Cell 33 or Cell 36.

d)  For Cell 31 in the IE "MBSFN inter frequency neighbour list" of the MBMS GENERAL INFORMATION message the SS adds (i) the frequency for Cell 36 with the IE "MBSFN services notification" set to "MBSFN services not notified" and with the option "All MBSFN services notified" included, and (ii) the frequency for Cell 33 with the IE "MBSFN services notification" set to "MBSFN services not notified" without the option "All MBSFN services notified". The SS sends MBMS MODIFIED SERVICES INFORMATION with IE "MBMS re-acquire MCCH" set to "True".

e)  The UE shall re-perform the MCCH acquisition procedure on Cell 31.

f)  The SS powers on Cell 33 and Cell 36. MCCH messages are transmitted by the SS on Cell 36 using MBMS configuration C2 (one PTM session ongoing - National Service 5) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108. MCCH messages are transmitted by the SS on Cell 33 using MBMS configuration C2 (one PTM session ongoing - National Service 5) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

g)  National Service 5 is activated at the UE.

h)  The UE shall retune to the frequency for Cell 36, perform MBSFN cluster reselection and shall perform the MCCH acquisition procedure on Cell 36.

i)  The UE immediately establishes the p-t-m radio bearer for National Service 5. The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

j)  On Cell 33 the SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for National Service 5. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD).

k)  The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is = 0.

l) On Cell 36 the SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for National Service 5. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD), or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD).

m) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0.

Expected sequence

| Step | Direction | | Carrier | Message | Comment |
|---|---|---|---|---|---|
| | UE | SS | | | |
| 1 | ← | | M | MBMS MCCH Message Configuration C1 | No sessions ongoing. IE "MBSFN inter frequency neighbour list" not present in MBMS GENERAL INFORMATION |
| 2 | ← | | U | ACTIVATE RB TEST MODE | |
| 3 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 4 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated with Short Transmission Identity = "0". |
| 5 | ← | | M | MBMS MCCH Message Configuration C1 | Cell 31: IE "MBMS re-acquire MCCH" set to "True" in MBMS MODIFIED SERVICES INFO. Frequencies for Cell 33 and Cell 36 have been added to IE "MBSFN inter frequency neighbour list". |
| 6 | UE | | M | | UE re-acquires MCCH on Cell 31. |
| 7 | | SS | | | The SS powers on Cell 33 and Cell 36. |
| 8 | ← | | M | MBMS MCCH Message Configuration C2 | Cell 33: One PTM session ongoing (National Service 5). 129.6(FDD) or 124(TDD)kbps PS RAB, 124.4 kbps (IMB) |
| 9 | ← | | M | MBMS MCCH Message Configuration C2 | Cell 36: One PTM session ongoing (National Service 5). 129.6(FDD) or 124(TDD)kbps PS RAB, 124.4 kbps (IMB) |
| 10 | UE | | M | | National Service 5 is activated at the UE. |
| 11 | UE | | M | | UE retunes to frequency for Cell 36 and acquires the MCCH. |
| 12 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer for National Service 5 and close the test loop. |
| 13 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH for Cell 33. |
| 14 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 15 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is equal to zero. |
| 16 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH for Cell 36. |
| 17 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 18 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 19 | ← | | U | OPEN UE TEST LOOP | |
| 20 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 21 | ← | | U | DEACTIVATE RB TEST MODE | |
| 22 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

With the following exceptions, all messages have the same content as defined in TS 34.108 clause 9.1.3 for the MBSFN carriers and in TS 34.108 clause 9.1.1 or 9.1.2 for the unicast carrier:

MBMS MODIFIED SERVICES INFORMATION (Step 1, Step 8, and Step 9)

| Information Element | Value/remark | Version |
|---|---|---|
| Modified service list | Not Present | Rel-6 |
| MBMS re- acquire MCCH | Not Present | Rel-6 |
| MBMS dynamic persistence level | Not Present | Rel-6 |
| End of modified MCCH information | Not Present | Rel-6 |
| MBMS number of neighbour cells | 0 | Rel-6 |
| MBMS all unmodified p-t-m services | Not Present | Rel-6 |
| MBMS p-t-m activation time | Not Present | Rel-6 |
| MIB Value tag | Not Present | Rel-7 |

MBMS UNMODIFIED SERVICES INFORMATION (Dedicated National carrier) (Step 1 and Step 5)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | Not Present | Rel-6 |

MBMS GENERAL INFORMATION (Step 1)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | Not Present | Rel-7 |

MBMS MODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark | Version |
|---|---|---|
| Modified service list | Not Present | Rel-6 |
| MBMS re- acquire MCCH | True | Rel-6 |
| MBMS dynamic persistence level | Not Present | Rel-6 |
| End of modified MCCH information | Not Present | Rel-6 |
| MBMS number of neighbour cells | 0 | Rel-6 |
| MBMS all unmodified p-t-m services | Not Present | Rel-6 |
| MBMS p-t-m activation time | Not Present | Rel-6 |
| MIB Value tag | Not Present | Rel-7 |

MBMS GENERAL INFORMATION (Step 5)(FDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 5)(TDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - All MBSFN services notified | TRUE | |

MBMS GENERAL INFORMATION (Step 5)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - IMB indication | TRUE | Rel-8 |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - IMB indication | TRUE | Rel-8 |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - All MBSFN services notified | TRUE | |

MBMS UNMODIFIED SERVICES INFORMATION (Step 8)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 4 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | '01' | |
| - MBMS required UE action | Acquire PTM RB info | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 1) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |

| Information Element | Value/remark | Version |
|---|---|---|
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 2) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |

MBMS UNMODIFIED SERVICES INFORMATION (Step 8)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 2 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | '01' | |
| - MBMS required UE action | Acquire PTM RB info | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |

MBMS GENERAL INFORMATION (Step 8)(FDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 8)(TDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f1" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 8)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - IMB indication | TRUE | Rel-8 |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - IMB indication | TRUE | Rel-8 |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS UNMODIFIED SERVICES INFORMATION (Step 9)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 8 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 1) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 2) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 3) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 4) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | '01' | |
| - MBMS required UE action | Acquire PTM RB info | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 2 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 2 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 1) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |

| Information Element | Value/remark | Version |
|---|---|---|
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 2 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 2) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 2 | Rel-7 |

MBMS UNMODIFIED SERVICES INFORMATION (Step 9) (IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 6 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 1) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 2) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 3) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 4) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 1 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | '01' | |
| - MBMS required UE action | Acquire PTM RB info | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 2 | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | 2 | Rel-7 |

MBMS GENERAL INFORMATION (Step 9)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f1" | |
| - CHOICE *MBSFN services notification* | MBSFN services notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE *MBSFN services notification* | MBSFN services notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 9)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - IMB indication | TRUE | Rel-8 |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - IMB indication | TRUE | Rel-8 |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

### 8.5.7.2.5 Test requirements

1) After step 15, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report that zero RLC SDUs have been received.

2) After step 18, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report that > 0 RLC SDUs have been received.

## 8.5.7.3 Re-acquire MCCH - modified MBSFN inter frequency neighbour list / MBSFN services not notified

### 8.5.7.3.1 Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.7.3.2 Conformance requirement

Upon receiving the MBMS GENERAL INFORMATION message, the UE should store all relevant IEs included in this message. The UE shall also:

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following.

…

For FDD, 3.84 Mcps TDD IMB and 3.84/7.68 Mcps TDD if the IE "MBSFN inter frequency neighbour list" is included and the UE does not receive a service from this MBSFN cluster, the UE shall:

1> consider that MBMS services transmitted in MBSFN mode are available on these frequencies;

…

1> if at least one frequency is listed for which "MBSFN services not notified" is indicated in the IE "MBSFN inter frequency neighbour list":

2> if the IE "All MBSFN services notified" is included for one frequency as defined in [21] for FDD and [22] for TDD on which the UE supports reception in MBSFN mode:

…

2> else:

3> attempt to receive notifications on all frequencies for which the IE "MBSFN services not notified" is indicated as specified in subclause 8.7.3 on that band.

…

Upon receiving the MBMS MODIFIED SERVICES INFORMATION message, the UE shall act as follows for each of the services included in this messages provided that the service is included in variable MBMS_ACTIVATED_SERVICES and upper layers indicate that the session has not yet been received correctly (referred to as 'applicable services'):

…

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following

…

If the UE receives the IE " MBMS re-acquire MCCH", the UE shall:

1> perform the MCCH acquisition procedure as specified in subclause 8.7.2.

Reference

3GPP TS 25.331 clauses 8.7.2.3, 8.7.2.5, 8.6.9.9ad, 8.7.3.4, 8.6.9.6a.

### 8.5.7.3.3 Test purpose

1. To verify that the UE correctly re-acquires the MCCH information when the UE receives the IE MBMS re-acquire MCCH in a received MBMS MODIFIED SERVICES INFORMATION message.

2. To verify that the UE acts upon the modified IE MBSFN inter frequency neighbour list received in the re-acquired MBMS GENERAL INFORMATION message when a service not received on the current MBSFN cluster is present in the variable MBMS_ACTIVATED_SERVICES.

3. To verify that in the absence of the IE "All MBSFN services notified" the UE attempts to receive notifications on all frequencies for which the IE "MBSFN services not notified" is indicated on that band.

### 8.5.7.3.4 Method of test

Initial condition

System Simulator:

- MBSFN carrier: 3 cells, Cell 31, Cell 36 and Cell 38 (all PLMN1). Cell 36 and Cell 38 are powered off. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default1 MCCH scheduling (No ongoing session) according to subclause 11.2 of TS 34.108.

Unicast carrier: 1 cell, Cell 1 (PLMN1) default configuration.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with no activated service as specified in clause 7.6.3 of TS 34.108.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

- Support of transmit and receive functions available on UE   Yes/No.

- Support of MBSFN receive only function available on UE   Yes/No.

Test procedure

The test shall be performed as two independent sub-tests with the UE and SS being returned to Initial Conditions between the sub-tests. The test method shall be the same for the two sub-tests with the exception that:

- In sub-test 1, Local Service 1 in Service Area 1 (Cell 33) shall be activated in the UE;

- In sub-test 2, Local Service 1 in Service Area 4 (Cell 36) shall be activated in the UE.

The SS shall apply the downlink power settings as shown below:

Step 1-7:

| Parameter | Unit | Cell 1 | Cell 31 | Cell 33 | Cell 36 |
|---|---|---|---|---|---|
| UTRA RF Channel Number | | Ch. 1 | Ch. 2 | Ch. 3 | Ch. 4 |
| P-CCPCH RSCP | dBm | -60 | -60 | OFF | OFF |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -60 | - | - |
| P-CPICH (IMB) | dBm/3.84MHz | | -60 | OFF | OFF |
| T-CPICH (IMB) | dBm/3.84MHz | | -50.5 | OFF | OFF |

Step 8-33:

| Parameter | Unit | Cell 1 | Cell 31 | Cell 33 | Cell 36 |
|---|---|---|---|---|---|
| UTRA RF Channel Number | | Ch. 1 | Ch. 2 | Ch. 3 | Ch. 4 |
| P-CCPCH RSCP | dBm | -60 | -60 | -60 | -60 |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -60 | -60 | -60 |
| P-CPICH (IMB) | dBm/3.84MHz | | -60 | -60 | -60 |
| T-CPICH (IMB) | dBm/3.84MHz | | -50.5 | -50.5 | -50.5 |

a) The UE is camping on Cell 1 and Cell 31. For 3.84 Mcps TDD IMB, the UE is camping on the FDD unicast carrier cell 1 and IMB cell 31. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 (no session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108. Note: The IE "MBSFN inter frequency neighbour list" is not present in MBMS GENERAL INFORMATION.

b) The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE.

c) The SS sends CLOSE UE TEST LOOP to activate RLC SDU counting on MTCH. The Short Transmission identity is set to value "2" corresponding to Local Service 1 (see TS 34.108 clause 11.2.4) on either Cell 33 or Cell 36.

d) For Cell 31 in the IE "MBSFN inter frequency neighbour list" of the MBMS GENERAL INFORMATION message the SS adds (i) the frequency for Cell 36 with the IE "MBSFN services notification" set to "MBSFN services not notified" and without the option "All MBSFN services notified", and (ii) the frequency for Cell 33 with the IE "MBSFN services notification" set to "MBSFN services not notified" without the option "All MBSFN services notified". The SS sends MBMS MODIFIED SERVICES INFORMATION with IE "MBMS re-acquire MCCH" set to "True".

e) The UE shall re-perform the MCCH acquisition procedure on Cell 31.

f) The SS powers on Cell 33 and Cell 36. MCCH messages are transmitted by the SS on Cell 36 using MBMS configuration C2 (one PTM session ongoing - Local Service 1) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108. MCCH messages are transmitted by the SS on Cell 33 using MBMS configuration C2 (one PTM session ongoing - Local Service 1) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

g) Local Service 1 for the Service Area determined by the sub-test number (see above) is activated at the UE.

h) The UE shall re-tune to the frequency for Cell 33 or Cell 36, perform MBSFN cluster reselection and shall perform the MCCH acquisition procedure. If the UE determines that the selected MBMS service is available on this cell then the UE proceeds to the next step. Otherwise, the UE re-tunes to the other frequency, performs MBSFN cluster reselection and again performs the MCCH acquisition procedure to find the selected MBMS service.

i) The UE immediately establishes the p-t-m radio bearer for Local Service 1. The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

j) On Cell 33 the SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for Local Service 1. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD), or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD).

k) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check the counter returned by the UE for the MTCH in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS stores the value.

l) On Cell 36 the SS broadcasts 10 RLC SDUs on the MTCH configured on the MBMS p-t-m radio bearer for Local Service 1. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD), or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or a 124 kbps RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD).

m) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check the counter returned by the UE for the MTCH in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE, using the stored initial count from step k).

Expected sequence

| Step | Direction | | Carrier | Message | Comment |
|------|-----|-----|---------|---------|---------|
| | UE | SS | | | |
| 1 | ← | | M | MBMS MCCH Message Configuration C1 | No sessions ongoing. IE "MBSFN inter frequency neighbour list" not present in MBMS GENERAL INFORMATION |
| 2 | ← | | U | ACTIVATE RB TEST MODE | |
| 3 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 4 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated with Short Transmission Identity = "2". |
| 5 | ← | | M | MBMS MCCH Message Configuration C1 | Cell 31: IE "MBMS re-acquire MCCH" set to "True" in MBMS MODIFIED SERVICES INFO. Frequencies for Cell 33 and Cell 36 have been added to IE "MBSFN inter frequency neighbour list". |
| 6 | UE | | M | | UE re-acquires MCCH on Cell 31. |
| 7 | | SS | | | The SS powers on Cell 33 and Cell 36. |
| 8 | ← | | M | MBMS MCCH Message Configuration C2 | Cell 33: One PTM session ongoing (Local Service 1). 129.6(FDD) or 124(TDD)kbps PS RAB. |
| 9 | ← | | M | MBMS MCCH Message Configuration C2 | Cell 36: One PTM session ongoing (Local Service 1). 129.6(FDD) or 124(TDD)kbps PS RAB. |
| 10 | UE | | M | | Local Service 1 is activated at the UE, for the Service Area determined by the sub-test execution number (see above). |
| 11 | | SS | | | The SS shall set a timer value of 300 seconds to wait for CLOSE UE TEST LOOP COMPLETE from the UE. If a timeout occurs the test shall be deemed failed and execution continues from step 20. |
| 12 | UE | | M | | UE retunes to frequency for Cell 33 and/or Cell 36 and acquires the MCCH. |
| 13 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer for Local Service 1 and close the test loop. |
| 14 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH for Cell 33. |
| 15 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 16 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks the number of reported RLC SDUs received on the MTCH. SS stores the value. |
| 17 | | SS | M | | The SS transmits 10 RLC SDUs on the MTCH for Cell 36. |
| 18 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 19 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks the number of reported RLC SDUs received on the MTCH. |
| 20 | ← | | U | OPEN UE TEST LOOP | |
| 21 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 22 | ← | | U | DEACTIVATE RB TEST MODE | |
| 23 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

With the following exceptions, all messages have the same content as defined in TS 34.108 clause 9.1.3 for the MBSFN carriers and in TS 34.108 clause 9.1.1 or 9.1.2 for the unicast carrier:

MBMS MODIFIED SERVICES INFORMATION (Step 1, Step 8, and Step 9)

| Information Element | Value/remark | Version |
|---|---|---|
| Modified service list | Not Present | Rel-6 |
| MBMS re- acquire MCCH | Not Present | Rel-6 |
| MBMS dynamic persistence level | Not Present | Rel-6 |
| End of modified MCCH information | Not Present | Rel-6 |
| MBMS number of neighbour cells | 0 | Rel-6 |
| MBMS all unmodified p-t-m services | Not Present | Rel-6 |
| MBMS p-t-m activation time | Not Present | Rel-6 |
| MIB Value tag | Not Present | Rel-7 |

MBMS UNMODIFIED SERVICES INFORMATION (Dedicated National carrier) (Step 1 and Step 5)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | Not Present | Rel-6 |

MBMS GENERAL INFORMATION (Step 1)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | Not Present | Rel-7 |

MBMS MODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark | Version |
|---|---|---|
| Modified service list | Not Present | Rel-6 |
| MBMS re- acquire MCCH | True | Rel-6 |
| MBMS dynamic persistence level | Not Present | Rel-6 |
| End of modified MCCH information | Not Present | Rel-6 |
| MBMS number of neighbour cells | 0 | Rel-6 |
| MBMS all unmodified p-t-m services | Not Present | Rel-6 |
| MBMS p-t-m activation time | Not Present | Rel-6 |
| MIB Value tag | Not Present | Rel-7 |

MBMS GENERAL INFORMATION (Step 5) (FDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 5) (TDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 5)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - IMB indication | TRUE | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - IMB indication | TRUE | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS UNMODIFIED SERVICES INFORMATION (Step 8)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 4 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 1) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | '01' | |
| - MBMS required UE action | Acquire PTM RB info | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 2) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |

MBMS UNMODIFIED SERVICES INFORMATION (Step 8)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 2 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |

MBMS GENERAL INFORMATION (Step 8)(FDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE mode | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE mode | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 8)(TDD)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE mode | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f1" | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE mode | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 8)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - IMB indication | TRUE | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE *mode* | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - IMB indication | TRUE | |
| - CHOICE *MBSFN services notification* | MBSFN services not notified | |
| - no data | | |

MBMS UNMODIFIED SERVICES INFORMATION (Step 9)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 4 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 1) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | '01' | |
| - MBMS required UE action | Acquire PTM RB info | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (Local Service 2) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |

MBMS UNMODIFIED SERVICES INFORMATION (Step 9) (IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| Message type | | Rel-6 |
| Unmodified service list | 2 services | Rel-6 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 5) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |
| - MBMS Transmission identity | | |
| - MBMS Service ID | (National Service 6) | |
| - MBMS Service ID | Refer to clause 11.2.4 "MBSFN service availability" | |
| - CHOICE PLMN identity | SameAs-MIB | |
| - no data | | |
| - MBMS Session ID | Not Present | |
| - MBMS required UE action | None | |
| - MBMS preferred frequency | Not Present | |
| - MBSFN cluster frequency | Not Present (MD) | Rel-7 |

MBMS GENERAL INFORMATION (Step 9)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE mode | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f1" | |
| - CHOICE MBSFN services notification | MBSFN services notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE mode | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE MBSFN services notification | MBSFN services notified | |
| - no data | | |

MBMS GENERAL INFORMATION (Step 9)(IMB)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE mode | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - IMB indication | TRUE | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |
| - MBSFN frequency | | |
| - CHOICE mode | TDD | |
| - UARFCN (Nt) | Refer to clause 5.1 "Test frequencies" for frequency "f3" | |
| - IMB indication | TRUE | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |

8.5.7.3.5 Test requirements

For sub-test 1:

1) After step 15, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a count > 0 for the number of RLC SDUs received.

2) After step 18, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a count corresponding to zero RLC SDUs.

For sub-test 2:

1) After step 15, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a count = 0 for the number of RLC SDUs received.

2) After step 18, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report a count > 0 for the number of RLC SDUs received.

## 8.5.7.4 MBSFN TDM Information / TDM services de-multiplexing

### 8.5.7.4.1 Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

### 8.5.7.4.2 Conformance requirement

For cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3 upon receiving the MBMS CURRENT CELL P-T-M RB INFORMATION message, the UE shall act as specified in subclauses 8.7.5.3.

…

The UE applies the MBMS p-t-m radio bearer configuration procedure whenever it detects that one of the activated services is provided by means of a p-t-m radio bearer. This may occur as part of the MCCH acquisition or the MBMS Notification procedure.

…

Upon completing the reception of the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION messages for an activated MBMS service, the UE shall:

1> if the UE is already receiving an MTCH and does not have the capability to receive the new service in addition:

2> the UE behaviour is undefined.

NOTE: In this case, the UE may request upper layers to prioritise the services and only receive the service(s) prioritised by upper layers.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if the UE previously received the service by means of a p-t-m radio bearer from a cell belonging to another MBMS cell group:

2> re-establish RLC;

2> re-initialise PDCP.

1> start immediately to use the indicated configuration unless specified otherwise;

1> start or continue receiving the indicated p-t-m radio bearers depending on its UE capabilities.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information i.e. the MBMS MODIFIED SERVICES INFORMATION message, MBMS UNMODIFIED SERVICES INFORMATION

message, MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION message should be acquired in the same modification period.

…

If the IE "MBSFN TDM Information List" is included, the UE shall:

1> assume that the MBMS service identified in IE "MBMS short transmission ID" can be received only in frame(s) with the CFN fulfilling the following equation:

(CFN div N) mod TDM_Rep = TDM_Offset + i, i = 0 to TDM_Length - 1

where

- N is the TTI (in number of 10ms frames) of the FACH

- TDM_Rep is the repetition period

- TDM_Offset is the offset

- TDM_Length is the number of TTIs the MBMS Service is transmitted, starting from TDM_Offset

- CFN is set according to subclause 8.5.15.3 (Initialisation for Cell_FACH).

Reference

3GPP TS 25.331 clauses 8.7.2.5, 8.7.5.2, 8.7.5.3, 8.6.9.9ae

### 8.5.7.4.3          Test purpose

1. To verify that the UE correctly acquires the MCCH, when two services included in the variable MBMS_ACTIVATED_SERVICES are broadcast in a time division multiplexed fashion in the current MBSFN cluster.

2. To verify that the UE correctly acts upon the IE MBSFN TDM Information List received in the MBMS CURRENT CELL P-T-M RB INFORMATION messages for the two services in the variable MBMS_ACTIVATED_SERVICES and correctly de-multiplexes the two sessions.

### 8.5.7.4.4          Method of test

Initial condition

System Simulator:

- MBSFN carrier: 1 cell, Cell 31 (PLMN1). In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 and Default 1 MCCH scheduling (one ongoing session) according to subclause 11.2 of TS 34.108.

- Unicast carrier : 1 cell, Cell 1 with default parameters.

User Equipment:

- On the unicast carrier cell the UE is in registered Idle Mode on PS (state 3) if the UE only supports PS domain or registered Idle Mode on CS/PS (state 7) if the UE supports both CS and PS domains, as specified in clause 7.2.2 of TS 34.108.

- The UE is in MBSFN Idle mode with one activated service as specified in clause 7.6.4 of TS 34.108. The UE has selected (i.e. it is included in MBMS_ACTIVATED_SERVICES variable) a national service for which a session will start on MBSFN Cell 31 (see TS 34.108 clause 11.2.4) during the test.

Related ICS/IXIT statements

- MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

- Support of transmit and receive functions available on UE    Yes/No.

- Support of MBSFN receive only function available on UE    Yes/No.

Test procedure

a) The UE is camping on Cell 1 and Cell 31. For 3.84 Mcps TDD IMB, the UE is camping on the FDD unicast carrier cell 1 and IMB cell 31. In addition to broadcasting System Information, MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C1 (no session ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

b) The SS sends ACTIVATE RB TEST MODE on the unicast carrier and the UE responds with ACTIVATE RB TEST MODE COMPLETE. The SS then sends CLOSE UE TEST LOOP to activate RLC SDU counting on Cell 31 MTCH (Transmission identity indicating the MBMS activated service).

c) The SS notifies on MCCH, for one modification period, about the start of the MBMS sessions. MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C4 (two PTM sessions starting) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

d) From the first SFN of the next modification period the SS transmits MCCH messages on Cell 31 using MBMS configuration C2 (two PTM sessions ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108

e) The UE establishes the p-t-m radio bearer for the activated service according to the specified service activation time (i.e. the first SFN of the modification period following the notification (step c). The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

f) The SS then broadcasts 10 RLC SDUs on the MTCH configured for the MBMS service not activated by the UE. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or the RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) of TS 34.108. The nominal data rate of the RB as given in TS 34.108 will be scaled down by the factor (TDM_Length/TDM_Rep) as described in TS 25.331 clause 8.6.9.9ae.

g) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is = 0.

h) The SS then broadcasts 10 RLC SDUs on the MTCH configured for the MBMS service activated by the UE. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or the RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) of TS 34.108. The nominal data rate of the RB as given in TS 34.108 will be scaled down by the factor (TDM_Length/TDM_Rep) as described in TS 25.331 clause 8.6.9.9ae.

i) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0.

j) The SS sends OPEN UE TEST LOOP. The UE responds with OPEN UE TEST LOOP COMPLETE.

k) MCCH messages are then transmitted by the SS on Cell 31 using MBMS configuration C1 (no sessions ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108.

l) The SS then delays for 5*modification period and then sends CLOSE UE TEST LOOP to re-start RLC SDU counting on Cell 31 MTCH (Transmission identity indicating the MBMS activated service).

m) The SS notifies on MCCH, for one modification period, about the start of the MBMS sessions. MCCH messages are transmitted by the SS on Cell 31 using MBMS configuration C4 (two PTM sessions starting) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108. A different TDM configuration from that notified in step c) is used.

n) From the first SFN of the next modification period the SS transmits MCCH messages on Cell 31 using MBMS configuration C2 (two PTM sessions ongoing) and Default1 MCCH scheduling according to clause 11.2 of TS 34.108

o) The UE establishes the p-t-m radio bearer for the activated service according to the specified service activation time (i.e. the first SFN of the modification period following the notification (step c). The UE closes the test loop and starts counting successfully received RLC PDUs on the MTCH. The UE will send CLOSE UE TEST LOOP COMPLETE.

p) The SS then broadcasts 10 RLC SDUs on the MTCH configured for the MBMS service not activated by the UE. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or the RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) of TS 34.108. The nominal data rate of the RB as given in TS 34.108 will be scaled down by the factor (TDM_Length/TDM_Rep) as described in TS 25.331 clause 8.6.9.9ae.

q) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is = 0.

r) The SS then broadcasts 10 RLC SDUs on the MTCH configured for the MBMS service activated by the UE. The service is carried on a 129.6kbps RB for MTCH with 80 ms TTI as specified in clause 6.10.3.4.4.6(FDD) or a 124.4 kbps RB for MTCH with 80 ms TTI as specified in clause 6.11.7.2.2.1 (3.84 Mcps TDD IMB) or the RB for MBSFN MTCH with 80ms TTI as specified in clause 6.10.3.4.4.9 (3.84 Mcps TDD) or clause 6.11.5.4.4.9 (1.28 Mcps TDD) or clause 6.11.6.4.4.9 (7.68 Mcps TDD) of TS 34.108. The nominal data rate of the RB as given in TS 34.108 will be scaled down by the factor (TDM_Length/TDM_Rep) as described in TS 25.331 clause 8.6.9.9ae.

s) The SS sends UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST and waits for the UE to respond with UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE. The SS shall check that the counter returned by the UE for the MTCH of the activated service in the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE is > 0.

Expected sequence

| Step | Direction | | Carrier | Message | Comment |
|---|---|---|---|---|---|
| | UE | SS | | | |
| 1 | ← | | U | ACTIVATE RB TEST MODE | |
| 2 | → | | U | ACTIVATE RB TEST MODE COMPLETE | |
| 3 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated for the selected national service on MTCH. |
| 4 | ← | | M | MBMS MCCH Message Configuration C4 | For one modification period. Two sessions starting, one of which is the activated service. |
| 5 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. Two sessions ongoing. |
| 6 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer and close the test loop. |
| 7 | | SS | M | | Then SS transmits 10 RLC SDUs on the MTCH, for the service not activated by the UE. |
| 8 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 9 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH equals zero. |
| 10 | | SS | M | | Then the SS transmits 10 RLC SDUs on the MTCH for the service activated by the UE. |
| 11 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 12 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 13 | ← | | U | OPEN UE TEST LOOP | |
| 14 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 15 | ← | | M | MBMS MCCH Message Configuration C1 | No sessions ongoing |
| 16 | | SS | M | | SS delays for a period 5*modification period. |
| 17 | ← | | U | CLOSE UE TEST LOOP | Loop back mode 3 is activated for the selected national service on MTCH. |
| 18 | ← | | M | MBMS MCCH Message Configuration C4 | For one modification period. Two sessions starting, one of which is the activated service. |
| 19 | ← | | M | MBMS MCCH Message Configuration C2 | No modified services. Two sessions ongoing |
| 20 | → | | U | CLOSE UE TEST LOOP COMPLETE | The UE shall establish the indicated p-t-m radio bearer and close the test loop. |
| 21 | | SS | M | | Then SS transmits 10 RLC SDUs on the MTCH, for the service not activated by the UE. |
| 22 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 23 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH equals zero. |
| 24 | | SS | M | | Then the SS transmits 10 RLC SDUs on the MTCH for the service activated by the UE. |
| 25 | ← | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 26 | → | | U | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC SDUs received on the MTCH is greater than zero. |
| 27 | ← | | U | OPEN UE TEST LOOP | |
| 28 | → | | U | OPEN UE TEST LOOP COMPLETE | |
| 29 | ← | | U | DEACTIVATE RB TEST MODE | |
| 30 | → | | U | DEACTIVATE RB TEST MODE COMPLETE | |

Specific message contents

With the following exceptions, all messages have the same content as defined in TS 34.108 clause 9.1.3 for the MBSFN carriers and in TS 34.108 clause 9.1.1 or 9.1.2 for the unicast carrier:

MBMS CURRENT CELL P-T-M RB INFORMATION (Step 4 and Step 5)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN TDM Info List | | Rel-7 |
| - MBMS short transmission ID | Index to the activated service | |
| - TDM_Rep | 8 | |
| - TDM_Offset | 4 | |
| - TDM_Length | 4 | |
| - MBMS short transmission ID | Index to the not activated service | |
| - TDM_Rep | 8 | |
| - TDM_Offset | 0 | |
| - TDM_Length | 2 | |

MBMS CURRENT CELL P-T-M RB INFORMATION (Step 18 and Step 19)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN TDM Info List | | Rel-7 |
| - MBMS short transmission ID | Index to the activated service | |
| - TDM_Rep | 4 | |
| - TDM_Offset | 0 | |
| - TDM_Length | 1 | |
| - MBMS short transmission ID | Index to the not activated service | |
| - TDM_Rep | 4 | |
| - TDM_Offset | 1 | |
| - TDM_Length | 3 | |

#### 8.5.7.4.5 Test requirements

1) After step 9, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report an SDU count = 0.

2) After step 12, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report an SDU count > 0.

3) After step 23, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report an SDU count = 0.

4) After step 26, the UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE message shall report an SDU count > 0.

## 8.5.7.5 MBSFN Session Reconfiguration / Change of MBSFN Cluster frequency on notification via MCCH (FDD)

#### 8.5.7.5.1 Definition

This test is applicable for UEs that support MBMS broadcast services in MBSFN mode and which support either both transmit and receive functions or MBSFN receive only function.

#### 8.5.7.5.2 Conformance requirement

The UE applies the MCCH acquisition procedure to determine the MBMS services available in the cell and to initiate reception of the services that the UE has activated. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle, URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH).

…

The UE shall detect the available MBMS services by acquiring the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3.

...

For cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3 the UE shall immediately acquire the MBMS GENERAL INFORMATION messages i.e. It shall not delay reception of these messages until it has completed the acquisition of the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION messages. Likewise for cells operating in MBSFN mode as indicated in subclause 8.1.1.6.3, the UE should immediately acquire the MBMS CURRENT CELL P-T-M RB INFORMATION.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information e.g. Both the MBMS MODIFIED SERVICES INFORMATION and the MBMS UNMODIFIED SERVICES INFORMATION message should be acquired in the same modification period.

…

When requested to acquire MBMS control information other than the MBMS ACCESS INFORMATION message, the UE shall:

   1> if requested to start reading MCCH at the next modification period:

      2> start reading MCCH at the beginning of the next modification period.

   1> otherwise

      2> start reading MCCH at the beginning of the next repetition period.

   1> if requested to stop reading MCCH at the end of the modification period:

      2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;

      2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly or until the end of the modification period.

   1> otherwise:

      2> continue reading MCCH until the required MBMS control information is received or until the UE detects a TTI in which no MCCH information is transmitted, whichever is first;

      2> continue reading MCCH in this manner at every subsequent repetition period, until the information is received correctly.

   NOTE 1: The UE may combine information received at different repetition periods within a modification period.

…

The MBMS notification procedure is used by the UE to respond to a notification provided by UTRAN, indicating a change applicable for one or more MBMS services the UE has activated. The procedure applies to all UEs supporting MBMS, irrespective of their state (idle and connected mode: URA_PCH, CELL_PCH, CELL_FACH and CELL_DCH). The actual notification mechanism to be used depends on the UE state.

…

The UE may:

   1> monitor the MBMS notification Indicator Channel (MICH);

   1> if a notification on the MICH for one or more of the MBMS services included in the variable MBMS_ACTIVATED_SERVICES is detected:

2> acquire the MBMS MODIFIED SERVICES INFORMATION message with delaying the reading of MCCH until the next modification period and with stopping at the end of the modification period, in accordance with subclause 8.7.1.3;

2> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

The UE shall:

1> if in idle mode, URA_PCH, CELL_PCH or CELL_FACH state:

2> if not monitoring MICH during the current or the previous modification period:

3> acquire the MBMS MODIFIED SERVICES INFORMATION message from MCCH at the start of every modification period, in accordance with subclause 8.7.1.3;

3> handle the MBMS MODIFIED SERVICES INFORMATION message as specified in subclause 8.7.3.4.

…

If the IE "MBMS required UE action" is included and concerns an MBMS activated service the UE shall:

…

1> if the IE "MBMS required UE action" is set to 'Acquire PTM RB info'; or

1> if the IE "MBMS required UE action" is set to 'Acquire counting info – PTM RBs unmodified' and the UE is not receiving a p-t-m RB for the concerned service:

2> continue acquiring the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION messages without delaying reading of MCCH until the next modification period and without stopping at the end of the modification period, in accordance with subclause 8.7.1.3

2> act upon the MBMS COMMON P-T-M RB INFORMATION, MBMS CURRENT CELL P-T-M RB INFORMATION and the MBMS NEIGHBOURING CELL P-T-M RB INFORMATION message, if received, in accordance with subclause 8.7.5;

…

Upon completing the reception of the MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION messages for an activated MBMS service, the UE shall:

1> if the UE is already receiving an MTCH and does not have the capability to receive the new service in addition:

2> the UE behaviour is undefined.

NOTE: In this case, the UE may request upper layers to prioritise the services and only receive the service(s) prioritised by upper layers.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;

1> if the UE previously received the service by means of a p-t-m radio bearer from a cell belonging to another MBMS cell group:

2> re-establish RLC;

2> re-initialise PDCP.

1> start immediately to use the indicated configuration unless specified otherwise;

1> start or continue receiving the indicated p-t-m radio bearers depending on its UE capabilities.

The UE shall continue acquiring the above messages until it has received a consistent set of MCCH information i.e. the MBMS MODIFIED SERVICES INFORMATION message, MBMS UNMODIFIED SERVICES INFORMATION message, MBMS COMMON P-T-M RB INFORMATION and the MBMS CURRENT CELL P-T-M RB INFORMATION message should be acquired in the same modification period.

…

The UE shall:

    1> if the IE "Secondary CCPCH system information MBMS" is included:

        2> apply the Secondary CCPCH and FACH indicated by the IE "FACH carrying MCCH" for receiving MCCH.

    1> otherwise, if the IE "Secondary CCPCH system information" includes the IE "MCCH configuration information":

        2> apply the Secondary CCPCH and FACH indicated by the IE "MCCH configuration information" for receiving MCCH.

    1> for TDD, if the IE "TDD MBSFN Information" is included:

        2> apply the scrambling codes (as referenced by the "Cell parameters ID") to each timeslot indicated by "TDD MBSFN Information".

Reference

3GPP TS 25.331 clauses 8.7.2.1, 8.7.2.3, 8.7.1.3, 8.7.3.1, 8.7.3.3.1, 8.6.9.6, 8.7.5.3, 8.1.1.6.5

### 8.5.7.5.3 Test purpose

To verify that the UE correctly handles the notification procedure after receiving the MBMS MODIFIED SERVICES INFORMATION message via MCCH indicating a change in available services.

To verify that the UE acts upon service priority indications from upper layers that require a change in MBSFN cluster frequency.

To verify that the UE acquires the MBMS information on MCCH after selecting the new MBSFN cluster.

To verify that the UE, after acquiring the MBMS information on MCCH, starts the p-t-m reception of the higher priority MBMS service according to the information on MCCH..

### 8.5.7.5.4 Method of test

Initial condition

System Simulator:

    - MBSFN carrier: 2 cells, Cell 31 and Cell 33, the tow cells are in deferent MBSFN cluster.

User Equipment:

    - The UE is in MBSFN Idle mode with one activated service as specified in clause 7.6.4 of TS 34.108. The UE has selected (i.e. it is included in MBMS_ACTIVATED_SERVICES variable) a national service for which a session will start on MBSFN Cell 31 during the test.

Related ICS/IXIT statements

    - MBMS Broadcast services in MBSFN mode application available on UE   Yes/No.

    - Support of transmit and receive functions available on UE   Yes/No.

    - Support of MBSFN receive only function available on UE   Yes/No.

Test procedure

    a) The UE camps on Cell 31 in idle state and establish to start receiving MBMS Service_1.

    b) Another MBMS Service_2 is set up in Cell 33 and the SS sends a notification to the UE about the active services in Cell 31 by MCCH.

    c) The UE gets the IE "MBSFN cluster frequency" which is updated and selects MBMS Service_2,then ,the UE shall stop receiving Service_1 and perform Cell Reselection from Cell 31 to Cell 33.

d)  After selecting the new MBSFN cluster, the UE acquires the MBMS information on MCCH; the UE starts the p-t-m reception of the MBMS Service_2.

Expected sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| | | | | The UE camps on Cell 31 and starts reception of the MBMS Service_1 |
| 1 | | ← | MBMS MODIFIED SERVICES INFORMATION | The MBMS Service_2 has been activated by upper layer in the other MBSFN cluster. The SS notifies the UE the MBMS Service_2 is available on the MCCH. |
| 2 | | ← | MBMS GENERAL INFORMATION | The UE gets the MBSFN inter frequency neighbour list including Cell 33. |
| 3 | | | | The UE selects the MBMS Service_2 |
| 4 | | | | The UE performs Cell Reselection to select new MBSFN cluster. |
| 5 | | ← | MBMS MODIFIED SERVICES INFORMATION | In Cell 33, the UE acquires the MBMS information on MCCH. |
| 6 | | ← | MBMS COMMON P-T-M RB INFORMATION | |
| 7 | | ← | MBMS UNMODIFIED SERVICES INFORMATION | The UE starts reception of the MBMS Service_2 on MTCH. |
| 8 | | ← | CLOSE UE TEST LOOP | |
| 9 | → | | CLOSE UE TEST LOOP COMPLETE | Loop back mode 3 on MTCH is activated. |
| 10 | SS | | | The SS broadcasts 10 RLC SDUs of MBMS data on MTCH on the concerned MBMS radio bearer. |
| 11 | | ← | UE TEST LOOP MODE 3 RLC SDU COUNTER REQUEST | |
| 12 | → | | UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE | The SS checks that the number of reported RLC PDUs is greater than zero and records the value. |

Specific Message Contents.

MBMS MODIFIED SERVICES INFORMATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Modified service list | |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |
| - MBSFN cluster frequency | 2 |

MBMS GENERAL INFORMATION (Step 2)

| Information Element | Value/remark | Version |
|---|---|---|
| … | | |
| MBSFN inter frequency neighbour list | | Rel-7 |
| - MBSFN frequency | | |
| - CHOICE mode | FDD | |
| - UARFCN downlink (Nd) | Refer to clause 5.1 "Test frequencies" for frequency "f2" | |
| - CHOICE MBSFN services notification | MBSFN services not notified | |
| - no data | | |

MBMS MODIFIED SERVICES INFORMATION (Step 5)

| Information Element | Value/remark |
|---|---|
| Modified service list | |
| - MBMS Transmission identity | MBMS Transmission identity indicating MBMS activated service |
| - MBMS required UE action | Acquire PTM RB info |
| - MBSFN cluster frequency | The Current MBSFN Cluster |

UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE (Step 7)

| Information Element | Value/remark |
|---|---|
| RLC SDU Counter Value | Check that the number is greater than zero. |

8.5.7.5.5 Test requirements

At step 4 the UE shall select new MBSFN Cluster and perform Cell Reselection from Cell 31 to Cell 33.

At step 12 the UE shall send a UE TEST LOOP MODE 3 RLC SDU COUNTER RESPONSE with a RLC SDU counter value greater zero.

# 8.6 Minimization of Drive Test Specific Procedures

## 8.6.1 Immediate MDT

NOTE: Immediate MDT logging and reporting is provided by the UE through normal measurement procedures (subclause 8.4).

## 8.6.2 Logged MDT

### 8.6.2.1 Logged MDT / Intra-frequency measurement, logging and reporting / Idle mode

8.6.2.1.1 Definition

8.6.2.1.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.1.3.6 (TP3)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

    1> ignore the rest of the message.

If the values are identical, the UE shall:

...

    1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

        2> if an IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present and the registered PLMN is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE:

            3> include IE "ANR Logging Results Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS25.331, clause 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

    1> if IE "Logged Measurements Configuration Info" is present:

        2> if stored, discard the existing logged measurement configuration as well as the logged measurement information as specified in 8.5.66;

        2> store the received IEs "Logging Duration", "Logging Interval", "Area Configuration" if included in IE "Logged Measurements Configuration Info" in variable LOGGED_MEAS_CONFIG and IEs "Absolute Time Info", "Trace reference", "Trace recording session" and "TCE Id" in variable LOGGED_MEAS_REPORT_VARIABLE;

        2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOGGED_MEAS_REPORT_VARIABLE;

        2> start timer T326 with the timer value set to the IE "Logging Duration".

    NOTE:    The UE should not stop timer T326 unless explicitly stated when it moves to another RAT.

    1> if IE "Logged ANR configuration Info" is present:

        2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.68;

        2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

        2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

        2> store the list of Equivalent PLMNs in the IE "Equivalent PLMN Identity List" in variable LOG_ANR_REPORT_VARIABLE;

        2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

[TS25.331, clause 8.5.64.3 (TP2)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

   2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable
      LOGGED_MEAS_REPORT_VARIABLE:

      3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable
         LOGGED_MEAS_REPORT_VARIABLE is present:

         4>  set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

            5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the
               variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable
               LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in
               the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable
               LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it
               to include, in the same order as logged, one or more entries from
               LOGGED_MEAS_REPORT_VARIABLE;

            5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD"
               or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

            5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

               6> include IE "Logged Meas Available";

   2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

   ...

[TS25.331, clause 8.5.65 (TP1, TP2)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements has been configured, the UE shall:

   1> Store the available measurements according to the logged measurements configuration in
      LOGGED_MEAS_CONFIG variable as specified in subclause 8.5.65.2.

[TS25.331, clause 8.5.65.2 (TP1, TP2, TP4)]

While T326 is running, the UE shall:

   1> perform this logging in accordance with the following:

      2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the
         PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is
         present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

      2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable
         LOGGED_MEAS_CONFIG;

      2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the
         fields in accordance with the following:

         3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged
            measurement configuration was received;

         3> if GNSS location information became available during the last logging interval:

            4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4>else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

3GPP TS 25.304 clause 5.7 and TS 25.331 clauses 8.1.3.6, 8.5.63.3, 8.5.64.3, 8.5.65, 8.5.65.2.

8.6.2.1.3 Test Purpose

1. Verify logging of configured Logged MDT measurements in Idle mode.

2. Verify logging and reporting of Logged MDT Intra-frequency measurements.

3. Verify indication of availability of Logged MDT measurements at RRC connection establishment.

4. Verify presence of correct time stamp in Logged MDT measurement reports.

8.6.2.1.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 2 are active. Cell 1 and Cell 2 belongs to same PLMN, but have different Location Area Codes.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

Table 8.6.2.1-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.2.1-1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -69 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -69 | -69 | -60 |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

The SS transmits a RRC CONNECTION RELEASE message to release the RRC connection.

The UE transmits a RRC CONNECTION RELEASE COMPLETE message and enters idle mode

The SS waits 5s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in Table 8.6.2.1-1

The SS waits for random access on Cell 2 and page the UE. The UE transmits a RRC CONNECTION REQUEST message and SS respond by transmitting a RRC CONNECTION SETUP. The UE transmits a RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" present.

SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" present.

UE shall transmits a UE INFORMATION REPONSE message, and include IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | <-- | | LOGGING MEASUREMENT CONFIGURATION | |
| 2 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 3 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |
| 4 | | | | Wait 5s to allow UE to activate logging. |
| 5 | - | | - | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.2.1-1. The UE shall find that the cell 2 is better and attempt to perform a cell reselection. |
| 6 | - | | - | Wait for random access requests from the UE on Cell 2. |
| 7 | <-- | | Paging | SS transmits a Paging message on Cell 2. |
| 8 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 9 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 10 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" present. |
| 11 | <-- | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE" Logged Measurements Report Request" set to "true". |
| 12 | --> | | UE INFORMATION RESPONSE | UE shall transmit a UE INFORMATION RESPONSE message. |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.56 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

RRC CONNECTION SETUP COMPLETE (step 9)

| Information Element | Value/remark |
|---|---|
| Message Type RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | True |

UE INFORMATION REQUEST (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |

| Information Element | Value/remark |
|---|---|
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Checked to be present with a value bigger than 0. |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Primary CPICH info | Set to the scrambling code for cell 2 |
| - CPICH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Checked to be present with a value bigger than 0. |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Cell parameters Id | Cell parameter Id of Cell 2 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

8.6.2.1.5 Test requirement

At step 10 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "Logged Meas Available" (TP3).

At step 12 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 2 in the "Logged Measurements Intra Frequency Neighbouring Cells list" with the IE Absolute Time Info set equal to the value configured when the logged measurement configuration was received and the Relative Time Stamp indicating a value bigger than 0 indicating the elapsed time since the logged measurement configuration was received (TP1, TP2, TP4).

## 8.6.2.1a Logged MDT / Intra-frequency measurement, logging and reporting / Idle mode/PLMN list

### 8.6.2.1a.1 Definition

### 8.6.2.1a.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- the RPLMN of the UE is present in the MDT PLMN identity list, if received in the LOGGING MEASUREMENT CONFIGURATION message, or the RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.1.3.6 (TP1)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

1> ignore the rest of the message.

If the values are identical, the UE shall:

...

1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS 25.331, clause 8.5.64.3 (TP2)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

2> if Registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

 3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

  5> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

   5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

   5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

   5> include the IE "Trace recording session" and set it to the value of the IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

   5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

   5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

   5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

   5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

    6> include IE "Logged Meas Available";

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

 …

Reference

3GPP TS 25.304 clause 5.7 and TS 25.331 clauses 8.1.3.6, 8.5.64.3,

### 8.6.2.1a.3 Test Purpose

1. Verify indication of availability of Logged MDT measurements at RRC connection establishment in the cell that belongs to the PLMN included in LOGGING MEASUREMENT CONFIGURATION message.

2. Verify that Logged Meas Report (logged in idle mode) is reported in UE INFORMATION RESPONSE message.

### 8.6.2.1a.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 2 are active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108, the Attach Accept message in P2 procedure includes PLMN2 in the equivalent PLMN list.

Test Procedure

Table 8.6.2.1a-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.2.1a-1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -69 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -69 | -69 | -60 |
| PLMN | | PLMN 1 | | PLMN 2 | |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

The SS transmits a RRC CONNECTION RELEASE message to release the RRC connection.

The UE transmits a RRC CONNECTION RELEASE COMPLETE message and enters idle mode

The SS waits 5s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in Table 8.6.2.1a-1

The SS waits for random access on Cell 2 and page the UE. The UE transmits a RRC CONNECTION REQUEST message and SS respond by transmitting a RRC CONNECTION SETUP. The UE transmits a RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" present.

Complete ROUTING AREA UPDATE procedure.

SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" present.

UE shall transmits a UE INFORMATION REPONSE message, and include IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | <-- | | LOGGING MEASUREMENT CONFIGURATION | |
| 2 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 3 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returs to Idle mode. |
| 4 | - | - | | Wait 5s to allow UE to activate logging. |
| 5 | - | - | | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.2.1a-1. The UE shall find that the cell 2 is better and attempt to perform a cell reselection. |

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 6 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 7 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 8 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" present. |
| 9 | --> | | RRC: INITIAL DIRECT TRANSFER NAS: ROUTING AREA UPDATE REQUEST | The UE transmits a ROUTING AREA UPDATE REQUEST message. |
| 10 | <-- | | RRC: DOWNLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE ACCEPT | The SS transmits a ROUTING AREA UPDATE ACCEPT message. |
| 11 | --> | | RRC: UPLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE COMPLETE | The UE transmits a ROUTING AREA UPDATE COMPLETE message. |
| 12 | <-- | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE" Logged Measurements Report Request" set to "true". |
| 13 | --> | | UE INFORMATION RESPONSE | UE shall transmit a UE INFORMATION RESPONSE message. |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.57 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |
| - PLMN Identity List | |
| - PLMN Identity | PLMN2 |

RRC CONNECTION SETUP COMPLETE (step 8)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |

| | |
|---|---|
| Logged Meas Available | True |

UE INFORMATION REQUEST (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 13)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|   - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - CHOICE mode | FDD |
|   - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
|    - Logged Measurement Info-FDD[x] | |
|    - Relative Time Stamp[x] | Checked to be present with a value bigger than 0. |
|    - Logged Measurements Serving Cell[x] | |
|     - PLMN Identity | PLMN 1 |
|     - Cell ID[x] | Cell 1 |
|     - Primary CCPCH RSCP[x] | (0..91) |
|     - CPICH Ec/N0 | (0..49) |
|    - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
|     - Primary CPICH info | Set to the scrambling code for cell 2 |
|     - CPICH RSCP | (0..91) |
|     - CPICH Ec/N0 | (0..49) |
|   - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 13)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|   - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT |

| Information Element | Value/remark |
|---|---|
| - Trace recording session | CONFIGURATION in step 1<br>Same value as sent by SS in LOGGING MEASUREMENT<br>CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT<br>CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x'<br>below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Checked to be present with a value bigger than 0. |
| - Logged Measurements Serving Cell[x] | |
| - PLMN Identity | PLMN 1 |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Cell parameters Id | Cell parameter Id of Cell 2 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

### 8.6.2.1a.5 Test requirement

At step 8 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "Logged Meas Available" (TP1).

At step 13 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 2 in the "Logged Measurements Intra Frequency Neighbouring Cells list" (TP2).

## 8.6.2.2 Logged MDT / Intra-frequency measurement, logging and reporting / CELL_PCH

### 8.6.2.2.1 Definition

### 8.6.2.2.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.3.1.3 (TP3)]

In case of cell update procedure the UE shall transmit a CELL UPDATE message.

…

The UE shall set the IEs in the CELL UPDATE message as follows:

…

1> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

   2> include IE "Logged Meas Available".

…

[TS 25.331, clause 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

1> if IE "Logged Measurements Configuration Info" is present:

   2> if stored, discard the existing logged measurement configuration as well as the logged measurement information as specified in 8.5.66;

   2> store the received IEs "Logging Duration", "Logging Interval", "Area Configuration" if included in IE "Logged Measurements Configuration Info" in variable LOGGED_MEAS_CONFIG and IEs "Absolute Time Info", "Trace reference", "Trace recording session" and "TCE Id" in variable LOGGED_MEAS_REPORT_VARIABLE;

   2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOGGED_MEAS_REPORT_VARIABLE;

   2> start timer T326 with the timer value set to the IE "Logging Duration".

NOTE:   The UE shall not stop timer T326 unless explicitly stated when it moves to another RAT.

   …

[TS 25.331, clause 8.5.64.3 (TP2)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

   2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

      3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

         6>   set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

            5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

            5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

            5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

6> include IE "Logged Meas Available";

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

…

[TS 25.331, clause 8.5.65 (TP1, TP2)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements has been configured, the UE shall:

1> Store the available measurements according to the logged measurements configuration in LOGGED_MEAS_CONFIG variable as specified in subclause 8.5.65.2.

[TS 25.331, clause 8.5.65.2 (TP1, TP2)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4> else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE:    The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

3GPP TS 25.304 clause 5.7 and TS 25.331 clauses 8.3.1.3, 8.5.63, 8.5.65, 8.5.65.2.

### 8.6.2.2.3 Test Purpose

1. Verify logging of configured Logged MDT measurements in CELL_PCH state.

2. Verify logging and reporting of Logged MDT Intra-frequency measurements.

3. Verify indication of availability of Logged MDT measurements in CELL UPDATE message.

### 8.6.2.2.4 Method of test

**Initial Condition**

System Simulator: 2 cells, Cell 1 and Cell 2 are active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

**Test Procedure**

Table 8.6.2.2-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.2.2-1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -69 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -69 | -69 | -60 |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to CELL_PCH.

The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message and enters CELL_PCH state.

Wait 5s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in Table 8.6.2.2-1

When the UE detects the presence of cell 2, it moves to CELL_FACH state and transmits a CELL UPDATE message on the uplink CCCH. The IE "Logged Meas Available" shall be present in the message.

Upon reception of CELL_UPDATE message, SS replies with a CELL UPDATE CONFIRM message with the IE "RRC State Indicator" set to "CELL_DCH".

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

UE shall transmits a UE INFORMATION REPONSE message, and include IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | |
| 2 | | ← | PHYSICAL CHANNEL RECONFIGURATION | The IE "RRC state indicator" is set to "CELL_PCH". |
| 3 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 5s to allow UE to activate logging. |
| 5 | | | | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.2.2-1. The UE shall find that the cell 2 is better and attempt to perform a cell reselection. |
| 6 | → | | CELL UPDATE | The UE moves to CELL_FACH state and transmits this message with the IE "Logged Meas Available" set as true |
| 7 | | ← | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_DCH". |
| 8 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE" Logged Measurements Report Request" set to "true". |
| 9 | → | | UE INFORMATION RESPONSE | UE shall transmit a UE INFORMATION RESPONSE message. |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.58 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

PHYSICAL CHANNEL RECONFIGURATION (Steps 2)

Use the same message sub-type titled "Packet to CELL_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

CELL UPDATE (Step 6)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
|   - SRNC Identity | Check to see if set to '0000 0000 0001' |
|   - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| Cell Update Cause | Check to see if set to 'Cell Re-selection' |
| Logged Meas Available | TRUE |

UE INFORMATION REQUEST (Step 8)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|  - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - CHOICE mode | FDD |
|   - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
|    - Logged Measurement Info-FDD[x] | |
|    - Relative Time Stamp[x] | Not checked |
|    - Logged Measurements Serving Cell[x] | |
|     - Cell ID[x] | Cell 1 |
|     - Primary CCPCH RSCP[x] | (0..91) |
|     - CPICH Ec/N0 | (0..49) |
|    - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
|     - Primary CPICH info | Set to the scrambling code for cell 2 |
|     - CPICH RSCP | (0..91) |
|     - CPICH Ec/N0 | (0..49) |
|  - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Cell parameters Id | Cell parameter Id of Cell 2 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

### 8.6.2.2.5 Test requirement

At step 6 the UE shall transmit a CELL UPDATE message on uplink DCCH including the IE "Logged Meas Available" (TP3).

At step 9 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 2 in the "Logged Measurements Intra Frequency Neighbouring Cells list" (TP1, TP2).

## 8.6.2.2a Logged MDT / Intra-frequency measurement, logging and reporting / CELL_PCH/PLMN list

### 8.6.2.2a.1 Definition

### 8.6.2.2a.2 Conformance requirement

[TS25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- the RPLMN of the UE is present in the MDT PLMN identity list, if received in the LOGGING MEASUREMENT CONFIGURATION message, or the RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.3.1.3 (TP1)]

In case of cell update procedure the UE shall transmit a CELL UPDATE message.

…

The UE shall set the IEs in the CELL UPDATE message as follows:

  …

  1> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

    2> include IE "Logged Meas Available".

  …

[TS 25.331, clause 8.5.64.3 (TP2)]

UE Shall:

  1> if IE "Logged Measurements Report Request" is present:

    2> if Registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

      3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

        7> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

          5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

          5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

          5> include the IE "Trace recording session" and set it to the value of the IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

          5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

          5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

          5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

          5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

            6> include IE "Logged Meas Available";

    2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

  …

Reference

3GPP TS 25.304 clause 5.7 and TS 25.331 clauses 8.3.1.3, 8.5.64.3,

8.6.2.2a.3 Test Purpose

1. Verify indication of availability of Logged MDT measurements obtained in CELL_PCH state at cell update procedure in the cell that to the PLMN included in LOGGING MEASUREMENT CONFIGURATION message.

2. Verify that Logged Meas Report (logged in CELL_PCH state) is reported in UE INFORMATION RESPONSE message.

8.6.2.2a.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 2 are active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108, the Attach Accept message in P2 procedure includes PLMN2 in the equivalent PLMN list.

Test Procedure

Table 8.6.2.2a-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.2.2a-1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -69 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -69 | -69 | -60 |
| PLMN | | PLMN 1 | | PLMN 2 | |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to CELL_PCH.

The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message and enters CELL_PCH state.

Wait 5s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in Table 8.6.2.2a-1

When the UE detects the presence of cell 2, it moves to CELL_FACH state and transmits a CELL UPDATE message on the uplink CCCH. The IE "Logged Meas Available" shall be present in the message.

Upon reception of CELL_UPDATE message, SS replies with a CELL UPDATE CONFIRM message with the IE "RRC State Indicator" set to "CELL_DCH".

Completes ROUTING AREA UPDATE procedure.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

UE shall transmits a UE INFORMATION REPONSE message, and include IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | |
| 2 | | ← | PHYSICAL CHANNEL RECONFIGURATION | The IE "RRC state indicator" is set to "CELL_PCH". |
| 3 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE sends this message before it completes state transition. |
| 4 | - | | - | Wait 5s to allow UE to activate logging. |
| 5 | - | | - | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.2.2a-1. The UE shall find that the cell 2 is better and attempt to perform a cell reselection. |
| 6 | → | | CELL UPDATE | The UE moves to CELL_FACH state and transmits this message with the IE "Logged Meas Available" set as true |
| 7 | | ← | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_DCH". |
| 8 | --> | | RRC: INITIAL DIRECT TRANSFER NAS: ROUTING AREA UPDATE REQUEST | The UE transmits a ROUTING AREA UPDATE REQUEST message. |
| 9 | <-- | | RRC: DOWNLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE ACCEPT | The SS transmits a ROUTING AREA UPDATE ACCEPT message. |
| 10 | --> | | RRC: UPLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE COMPLETE | The UE transmits a ROUTING AREA UPDATE COMPLETE message. |
| 11 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE" Logged Measurements Report Request" set to "true". |
| 12 | → | | UE INFORMATION RESPONSE | UE shall transmit a UE INFORMATION RESPONSE message. |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |

| | |
|---|---|
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.59 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |
| - PLMN Identity List | |
| - PLMN Identity | PLMN2 |

PHYSICAL CHANNEL RECONFIGURATION (Steps 2)

Use the same message sub-type titled "Packet to CELL_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

CELL UPDATE (Step 6)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
| - SRNC Identity | Check to see if set to '0000 0000 0001' |
| - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| Cell Update Cause | Check to see if set to 'Cell Re-selection' |
| Logged Meas Available | TRUE |

UE INFORMATION REQUEST (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' |

| Information Element | Value/remark |
|---|---|
|   - Logged Measurement Info-FDD[x] | below. |
|   - Relative Time Stamp[x] | Not checked |
|   - Logged Measurements Serving Cell[x] | |
|    - PLMN Identity | PLMN 1 |
|    - Cell ID[x] | Cell 1 |
|    - Primary CCPCH RSCP[x] | (0..91) |
|    - CPICH Ec/N0 | (0..49) |
|   - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
|    - Primary CPICH info | Set to the scrambling code for cell 2 |
|    - CPICH RSCP | (0..91) |
|    - CPICH Ec/N0 | (0..49) |
|  - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|  - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|  - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|  - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - CHOICE mode | TDD |
|   - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
|   - Logged Measurement Info-TDD[x] | |
|   - Relative Time Stamp[x] | Not checked |
|   - Logged Measurements Serving Cell[x] | |
|    - PLMN Identity | PLMN 1 |
|    - Cell ID | Cell 1 |
|    - Primary CCPCH RSCP | (0..91) |
|   - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
|    - Cell parameters Id | Cell parameter Id of Cell 2 |
|    - Primary CCPCH RSCP | (0..91) |
|  - Logged Meas Available | Not checked |

8.6.2.2a.5 Test requirement

At step 6 the UE shall transmit a CELL UPDATE message on uplink DCCH including the IE "Logged Meas Available" (TP1).

At step 12 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 2 in the "Logged Measurements Intra Frequency Neighbouring Cells list" (TP2).

## 8.6.2.3    Logged MDT / Inter-frequency measurement, logging and reporting / URA_PCH

### 8.6.2.3.1        Definition

### 8.6.2.3.2        Conformance requirement

[TS 25.304, clause 5.7 (TP1)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

> NOTE:     Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.3.1.3 (TP3)]

…

In case of URA update procedure the UE shall transmit a URA UPDATE message.

> …

The UE shall set the IEs in the URA UPDATE message as follows:

> …

1> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

2> include IE "Logged Meas Available".

> …

[TS 25.331, clause 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

1> if IE "Logged Measurements Configuration Info" is present:

2> if stored, discard the existing logged measurement configuration as well as the logged measurement information as specified in 8.5.66;

2> store the received IEs "Logging Duration", "Logging Interval", "Area Configuration" if included in IE "Logged Measurements Configuration Info" in variable LOGGED_MEAS_CONFIG and IEs "Absolute Time Info", "Trace reference", "Trace recording session" and "TCE Id" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> start timer T326 with the timer value set to the IE "Logging Duration".

NOTE: The UE shall not stop timer T326 unless explicitly stated when it moves to another RAT.

…

[TS 25.331, clause 8.5.64.3 (TP2)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

8> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

6> include IE "Logged Meas Available";

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

…

[TS 25.331, clause 8.5.65 (TP1, TP2)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements has been configured, the UE shall:

1> Store the available measurements according to the logged measurements configuration in LOGGED_MEAS_CONFIG variable as specified in subclause 8.5.65.2.

[TS 25.331, clause 8.5.65.2 (TP1, TP2)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

    3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

    3> if GNSS location information became available during the last logging interval:

        4> if the UE has been able to calculate a 3-dimensional position:

            5> set IE "Ellipsoid point with altitude" to include the location coordinates;

        4>else:

            5> set IE "Ellipsoid point" to include the location coordinates:

    3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

    3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

    3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

    3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

    3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

### 8.6.2.3.3 Test Purpose

1. Verify logging of configured Logged MDT measurements in URA_PCH state

2. Verify logging and reporting of Logged MDT Inter-frequency measurements

3. Verify indication of availability of Logged MDT measurements in URA UPDATE message

### 8.6.2.3.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 4 are active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

Table 8.6.2.3-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.2.3-1**

| Parameter | Unit | Cell 1 | | Cell 4 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -69 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -69 | -69 | -60 |
| URA ID | | URA-ID 1 | | URA-ID 2 | |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to URA_PCH.

The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message and enters URA_PCH state.

Wait 5s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in Table 8.6.2.3-1.

When the UE detects the presence of cell 4, it moves to CELL_FACH state and transmits a URA UPDATE message on the uplink CCCH. The IE "Logged Meas Available" shall be present in the message.

Upon reception of URA_UPDATE message, SS replies with a URA UPDATE CONFIRM message with the IE "RRC State Indicator" set to "CELL_DCH".

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

UE shall transmits a UE INFORMATION REPONSE message, and include IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | ← | | LOGGING MEASUREMENT CONFIGURATION | The UE is in idle mode and camped onto cell 1. The System Information Block type 11 messages to be transmitted are different from the default settings (see specific message contents) |
| 2 | ← | | PHYSICAL CHANNEL RECONFIGURATION | The IE "RRC state indicator" is set to "URA_PCH". |
| 3 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 5s to allow UE to activate logging. |
| 5 | | | | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.2.3-1. The UE shall find that the Cell 4 is better and attempt to perform a cell reselection. |

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| 6 | → | | URA UPDATE | The UE transmits this message with the IE "Logged Meas Available" set as true |
| 7 | | ← | URA UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_DCH". |
| 8 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 9 | → | | UE INFORMATION RESPONSE | UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" and the IEs "Absolute Time Info", "Trace reference", "Trace recording session", "TCE Id" set to same value as received in the LOGGING MEASUREMENT CONFIGURATION in step 1. And at least one IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" includes "Logged Measurements Serving Cell" and "Logged Measurements Inter Frequency Neighbouring Cells list". And Logged Measurements of Cell 4 is in the Logged Measurements inter Frequency Neighbouring Cells list". |

Specific Message Contents

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.60 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

PHYSICAL CHANNEL RECONFIGURATION (Steps 2)

Use the same message sub-type titled "Packet to URA_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

URA UPDATE (Step 6)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
|   - SRNC Identity | Check to see if set to '0000 0000 0001' |
|   - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| URA Update Cause | Check to see if set to 'Cell Re-selection' |
| Logged Meas Available | TRUE |

UE INFORMATION REQUEST (Step 8)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|  - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - CHOICE mode | FDD |
|   - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
|    - Logged Measurement Info-FDD[x] | |
|    - Relative Time Stamp[x] | Not checked |
|    - Logged Measurements Serving Cell[x] | |
|     - Cell ID[x] | Cell 1 |
|     - Primary CCPCH RSCP[x] | (0..91) |
|     - CPICH Ec/N0 | (0..49) |
| - Logged Measurements Inter Frequency Neighbouring Cells list[x] | Only 1 inter Frequency |
| - Frequency Info | f2 |
| - Logged Measurements Inter-frequency Neighbouring Cells list | Only 1 cell |
|    - Primary CPICH info | Set to the scrambling code for cell 4 |
|    - CPICH RSCP | (0..91) |
|    - CPICH Ec/N0 | (0..49) |
|  - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Inter Frequency Neighbouring Cells list[x] | Only 1 inter Frequency |
| - Frequency Info | f2 |
| - Logged Measurements Inter-frequency Neighbouring Cells list | Only 1 cell |
| - Cell parameters Id | Cell parameter Id of Cell 4 |
| - Logged Measurements Inter Frequency Neighbouring Cells list[x] | (0..91) |
| - Frequency Info | |
| - Logged Measurements Inter-frequency Neighbouring Cells list | |
| - Logged Meas Available | Not checked |

8.6.2.3.5 Test requirement

At step 6 the UE shall transmit a URA UPDATE message on uplink DCCH including the IE "Logged Meas Available" (TP3).

At step 9 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 4 in the "Logged Measurements Inter Frequency Neighbouring Cells list" (TP1, TP2).

## 8.6.2.3a Logged MDT / Intra-frequency measurement, logging and reporting / URA_PCH / PLMN list

8.6.2.3a.1 Definition

8.6.2.3a.2 Conformance requirement

[TS25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- the RPLMN of the UE is present in the MDT PLMN identity list, if received in the LOGGING MEASUREMENT CONFIGURATION message, or the RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.3.1.3 (TP1)]

…

In case of URA update procedure the UE shall transmit a URA UPDATE message.

   …

The UE shall set the IEs in the URA UPDATE message as follows:

   …

1> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

   2> include IE "Logged Meas Available".

   …

[TS 25.331, clause 8.5.64.3 (TP2)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

   2> if Registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

      3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

         9> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

            5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace recording session" and set it to the value of the IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

            5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

          5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

               6> include IE "Logged Meas Available";

     2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

...

Reference

3GPP TS 25.304 clause 5.7 and TS 25.331 clauses 8.3.1.3, 8.5.64.3,

### 8.6.2.3a.3 Test Purpose

1. Verify indication of availability of Logged MDT measurements obtained in URA_PCH state at URA update procedure in the cell that to the PLMN included in LOGGING MEASUREMENT CONFIGURATION message.

2. Verify that Logged Meas Report (logged in URA_PCH state) is reported in UE INFORMATION RESPONSE message.

### 8.6.2.3a.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 2 are active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108, the Attach Accept message in P2 procedure includes PLMN2 in the equivalent PLMN list.

Test Procedure

Table 8.6.2.3a-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.2.3a-1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -69 | -69 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -69 | -69 | -60 |
| URA ID | | URA-ID 1 | | URA-ID 2 | |
| PLMN | | PLMN 1 | | PLMN 2 | |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to URA_PCH.

The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message and enters URA_PCH state.

Wait 5s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in Table 8.6.2.3-1.

When the UE detects the presence of cell 2, it moves to CELL_FACH state and transmits a URA UPDATE message on the uplink CCCH. The IE "Logged Meas Available" shall be present in the message.

Upon reception of URA_UPDATE message, SS replies with a URA UPDATE CONFIRM message with the IE "RRC State Indicator" set to "CELL_DCH".

Completes ROUTING AREA UPDATE procedure.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

UE shall transmits a UE INFORMATION REPONSE message, and include IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | The UE is in idle mode and camped onto cell 1. The System Information Block type 11 messages to be transmitted are different from the default settings (see specific message contents) |
| 2 | | ← | PHYSICAL CHANNEL RECONFIGURATION | The IE "RRC state indicator" is set to "URA_PCH". |
| 3 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE sends this message before it completes state transition. |
| 4 | - | | - | Wait 5s to allow UE to activate logging. |
| 5 | - | | - | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.2.3-1. The UE shall find that the Cell 2 is better and attempt to perform a cell reselection. |
| 6 | → | | URA UPDATE | The UE transmits this message with the IE "Logged Meas Available" set as true |
| 7 | | ← | URA UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_DCH". |
| 8 | --> | | RRC: INITIAL DIRECT TRANSFER  NAS: ROUTING AREA UPDATE REQUEST | The UE transmits a ROUTING AREA UPDATE REQUEST message. |
| 9 | <-- | | RRC: DOWNLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE ACCEPT | The SS transmits a ROUTING AREA UPDATE ACCEPT message. |
| 10 | --> | | RRC: UPLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE COMPLETE | The UE transmits a ROUTING AREA UPDATE COMPLETE message. |
| 11 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 12 | → | | UE INFORMATION RESPONSE | UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report". |

Specific Message Contents

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.61 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |
| - PLMN Identity List | |
| - PLMN Identity | PLMN2 |

PHYSICAL CHANNEL RECONFIGURATION (Steps 2)

Use the same message sub-type titled "Packet to URA_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

URA UPDATE (Step 6)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
| - SRNC Identity | Check to see if set to '0000 0000 0001' |
| - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| URA Update Cause | Check to see if set to 'Cell Re-selection' |
| Logged Meas Available | TRUE |

UE INFORMATION REQUEST (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |

| Information Element | Value/remark |
|---|---|
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - PLMN Identity | PLMN 1 |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Primary CPICH info | Set to the scrambling code for cell 2 |
| - CPICH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - PLMN Identity | PLMN 1 |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Cell parameters Id | Cell parameter Id of Cell 2 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

8.6.2.3a.5 Test requirement

At step 6 the UE shall transmit a URA UPDATE message on uplink DCCH including the IE "Logged Meas Available" (TP1).

At step 12 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 2 in the "Logged Measurements Intra Frequency Neighbouring Cells list" (TP2).

## 8.6.2.4 Logged MDT / Intra-frequency measurement, logging and reporting / Idle mode / Limiting area scope

### 8.6.2.4.1 Definition

This test is applicable for all UEs that support Logged MDT services.

### 8.6.2.4.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1, TP2, TP3)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in camped normally state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE:    Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.5.65.2 (TP1, TP2, TP3)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4> else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.5.65.2

### .8.6.2.4.3 Test Purpose

1. Verify limiting area scope logging of configured Logged MDT measurements when area scope based on cell list is configured

2. Verify limiting area scope logging of configured Logging MDT measurements when area scope based on list of Location Areas is configured

3. Verify limiting area scope logging of configured Logging MDT measurements when area scope based on list of Routing Areas is configured.

### 8.6.2.4.4 Method of test

Initial conditions

System Simulator:

3 cells, cell 1, cell 2 and cell 3.

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test procedure

Table 8.6.2.4.4-1 illustrates the downlink power to be applied for the 3 cells. Column marked "T0" denotes the initial conditions, while columns marked "T1", "T2", "T3","T4", "T5" and "T6" are to be applied subsequently. The exact instants on which these values shall be applied are described in the text in this clause.

| Parameter | Unit | Cell 1 | | | | | | | Cell 2 | | | | | | | Cell 3 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T3 | T4 | T5 | T6 | T0 | T1 | T2 | T3 | T4 | T5 | T6 | T0 | T1 | T2 | T3 | T4 | T5 | T6 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | | | | | Mid Range Test Frequency | | | | | | | Mid Range Test Frequency | | | | | | |
| LAC | | 1 | | | | | | | 2 | | | | | | | 1 | | | | | | |
| RAC | | 1 | | | | | | | 2 | | | | | | | 2 | | | | | | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | OFF | OFF | -60 | OFF | OFF | -60 | OFF | -60 | OFF | OFF | -60 | OFF | OFF | OFF | OFF | -60 | OFF | OFF | -60 | OFF |
| P-CCPCH RSCP(TDD) | dBm | -60 | OFF | OFF | -60 | OFF | OFF | -60 | OFF | -60 | OFF | OFF | -60 | OFF | OFF | OFF | OFF | -60 | OFF | OFF | -60 | OFF |

a) SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a cell list on Cell 1 and only Cell 3 in the configured cell list. SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 2. Verify Logging MDT measurements on Cell 2.

b) SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 3. Verify Logging MDT measurements on Cell 3.

c) Re-configure logged measurement with limiting area scope using Location Areas list, only Cell 2 belongs to Location Areas in the list. SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 1. Verify Logging MDT measurements on Cell 1.

d) SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 2. Verify Logging MDT measurements on Cell 2.

e) Re-configure logged measurement with limiting area scope using Routing Areas list and only Cell 1 belongs to Routing Areas in configured Routing Areas list. SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 3. Verify Logging MDT measurements on Cell 3.

f) SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 1. Verify Logging MDT measurements on Cell 1.

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | <-- | LOGGING MEASUREMENT CONFIGURATION | SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a cell list on Cell 1. Only Cell 3 in configured cell list. |
| 2 | | <-- | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 3 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |
| 4 | - | | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T1 in Table 8.6.2.4.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 2. |
| 5 | - | - | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 6 | | <-- | Paging | SS transmits a Paging message. |
| 7 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 8 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 9 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present. |

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | UE | SS | | |
| 10 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 11 | --> | | RRC CONNECTION RELEASE COMPLETE | The UE confirms the connection release and returns to Idle mode. |
| 12 | | | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T2 in Table 8.6.2.4.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 3. |
| 13 | | | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 14 | <-- | | Paging | SS transmits a Paging message. |
| 15 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 16 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 17 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available". |
| 18 | <-- | | UE INFORMATION REQUEST | SS send an UE INFORMATION REQUEST message to get logMeas Report. |
| 19 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 3. |
| 20 | <-- | | LOGGING MEASUREMENT CONFIGURATION | SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a using Location Areas list on Cell 3, only Cell 2 belongs to Location Areas in the list. |
| 21 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode on Cell 3. |
| 22 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode |
| 23 | | | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T3 in Table 8.6.2.4.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 1. |
| 24 | | | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 25 | <-- | | Paging | SS transmits a Paging message. |
| 26 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 27 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 28 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present. |
| 29 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 30 | --> | | RRC CONNECTION RELEASE COMPLETE | The UE confirms the connection release and returns to Idle mode. |
| 31 | | | | SS changes power level of Cell 1, Cell 2, and Cell 3 according to the T4 in Table 8.6.2.4.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 2. |
| 32 | | | | Wait 10 seconds for UE logging interval timer to expire at least once. |
| 33 | <-- | | Paging | SS transmits a Paging message on Cell 2. |
| 34 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message on Cell 2. |
| 35 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message on Cell 2. |
| 36 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available". |
| 37 | <-- | | UE INFORMATION REQUEST | SS send a UE INFORMATION REQUEST message to get logMeas Report. |
| 38 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 2. |
| 39 | <-- | | LOGGING MEASUREMENT CONFIGURATION | SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a Routing Areas List on Cell 2. Only Cell 1 belongs to Routing Areas in configured Routing Areas list. |
| 40 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode on Cell 2. |
| 41 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |

| Step | Direction | | Message | Comments |
|------|------|------|---------|----------|
| | **UE** | **SS** | | |
| 42 | - | - | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T5 in Table 8.6.2.4.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 3. |
| 43 | | - | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 44 | <-- | | Paging | SS transmits a Paging message. |
| 45 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 46 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 47 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message and IE "Logged Meas Available" is not present. |
| 48 | <-- | | RRC CONNECTION RELEASE | SS transmits an RRC CONNECTION RELEASE message to release the RRC connection. |
| 49 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |
| 50 | | | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T6 in Table 8.6.2.4.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 1. |
| 51 | | | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 52 | <-- | | Paging | SS transmits a Paging message on Cell 1. |
| 53 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message on Cell1. |
| 54 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message on Cell 1. |
| 55 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE Logged Meas Available. |
| 56 | <-- | | UE INFORMATION REQUEST | SS send a UE INFORMATION REQUEST message to get logMeas Report. |
| 57 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 1? |
| 58 | <-- | | RRC CONNECTION RELEASE | SS transmits an RRC CONNECTION RELEASE message to release the RRC connection. |
| 59 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.59 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | |
| - Cell IDList | |
| - Cell ID | Cell 3 |

RRC CONNECTION SETUP COMPLETE (step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

RRC CONNECTION SETUP COMPLETE (step 17)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | True |

UE INFORMATION RESPONSE (FDD) (Step 19)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 3 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 19)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |

| Information Element | Value/remark |
|---|---|
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 3 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

LOGGING MEASUREMENT CONFIGURATION (Step 20)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | |
| - Location Area Code List | |
| - LAI | |
| - PLMN identity | Same as MIB |
| - LAC | 2 |

RRC CONNECTION SETUP COMPLETE (step 28)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

RRC CONNECTION SETUP COMPLETE (step 36)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | True |

UE INFORMATION RESPONSE (FDD) (Step 38)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 2 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 38)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 2 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

LOGGING MEASUREMENT CONFIGURATION (Step 39)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.56 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | |
| - Routing Code Area List | |
| - RAI | |
| - LAI | PLMN identity set to Same as MIB, and LAC=1 |
| - RAC | 1 |

RRC CONNECTION SETUP COMPLETE (step 47)

| Information Element | Value/remark |
|---|---|
| Message Type RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

RRC CONNECTION SETUP COMPLETE (step 55)

| Information Element | Value/remark |
|---|---|
| Message Type RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | True |

UE INFORMATION RESPONSE (FDD) (Step 57)

| Information Element | Value/remark |
|---|---|
| Message Type RRC transaction identifier Integrity check info | Arbitrarily selects an integer between 0 and 3 |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT |

| Information Element | Value/remark |
|---|---|
| | CONFIGURATION in step 29 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 57)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 29 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

8.6.2.4.5 Test requirements

At step 9, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present (TP1).

At step 17, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available" (TP1).

At step 19, the UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 3(TP1).

At step 28, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present (TP2).

At step 36, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available" (TP2).

At step 38, the UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 2 (TP2).

At step 47, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present (TP3).

At step 55 the UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available" (TP3).

At step 57 the UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 1(TP3).

## 8.6.2.4a Logged MDT / Intra-frequency measurement, logging and reporting / Idle mode / Limiting area scope / Cell ID list with PLMN identity

### 8.6.2.4a.1 Definition

This test is applicable for all UEs that support Logged MDT services.

### 8.6.2.4a.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- the RPLMN of the UE is present in the MDT PLMN identity list, if received in the LOGGING MEASUREMENT CONFIGURATION message, or the RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

> NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.5.65.2 (TP1, TP2)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is present in the "PLMN Identity List" stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

4>else:

5> set IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

4> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

3> set the IE "PLMN Identity" of the Logged Measurements Serving Cell to indicate the PLMN Identity of the cell the UE is camping on obtained from system information;

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE:    The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.5.65.2

## .8.6.2.4a.3        Test Purpose

1. Verify UE is logging when area scope based on Cell ID list with PLMN identity is configured and UE is camping on a cell in the Cell ID list with PLMN identity.

2. Verify UE is not logging of configured Logging MDT measurements when area scope based on Cell ID list with PLMN identity is configured and UE is camping on a cell not included in the Cell ID list with PLMN identity

## 8.6.2.4a.4        Method of test

Initial conditions

System Simulator:

   3 cells, cell 1, cell 2 and cell 3.

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108, the Attach Accept message in P2 procedure includes PLMN2 in the equivalent PLMN list.

Test procedure

Table 8.6.2.4a.4-1 illustrates the downlink power to be applied for the 3 cells. Column marked "T0" denotes the initial conditions, while columns marked "T1", "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the text in this clause.

| Parameter | Unit | Cell 1 | | | Cell 2 | | | Cell 3 | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | T0 | T1 | T2 | T0 | T1 | T2 | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | Mid Range Test Frequency | | | Mid Range Test Frequency | | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | OFF | OFF | OFF | -60 | OFF | OFF | OFF | -60 |
| P-CCPCH RSCP(TDD) | dBm | -60 | OFF | OFF | OFF | -60 | OFF | OFF | OFF | -60 |
| PLMN | | PLMN 1 | | | PLMN 2 | | | PLMN 2 | | |

a) SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a cell list on Cell 1 and only Cell 3 in the configured cell list. SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 2. Verify Logging MDT measurements on Cell 2.

b) SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 3. Verify Logging MDT measurements on Cell 3.

Expected sequence

| Step | Direction | | Message | Comments |
| --- | --- | --- | --- | --- |
| | UE | SS | | |
| 1 | | <-- | LOGGING MEASUREMENT CONFIGURATION | SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a cell list on Cell 1. Only Cell 3 in configured cell list. |
| 2 | | <-- | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 3 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |
| 4 | - | - | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 5 | - | | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T1 in Table 8.6.2.4a.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 2. |
| 6 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 7 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 8 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present. |
| 9 | --> | | RRC: INITIAL DIRECT TRANSFER NAS: ROUTING AREA UPDATE REQUEST | The UE transmits a ROUTING AREA UPDATE REQUEST message. |
| 11 | | <-- | RRC: DOWNLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE ACCEPT | The SS transmits a ROUTING AREA UPDATE ACCEPT message. |
| 12 | --> | | RRC: UPLINK DIRECT TRANSFER NAS: ROUTING AREA UPDATE COMPLETE | The UE transmits a ROUTING AREA UPDATE COMPLETE message. |
| 13 | | <-- | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 14 | --> | | RRC CONNECTION RELEASE COMPLETE | The UE confirms the connection release and returns to Idle mode. |
| 15 | | | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T2 in Table 8.6.2.4a.4-1. UE performs cell reselection and the UE moves to idle mode on Cell 3. |
| 16 | | | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 17 | | <-- | Paging | SS transmits a Paging message. |
| 18 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 19 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 20 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available". |

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 21 | <-- | | UE INFORMATION REQUEST | SS send an UE INFORMATION REQUEST message to get logMeas Report. |
| 22 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 3. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.59 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | |
| - Cell IDList | |
| - Cell ID | Cell 3 |
| - PLMN Identity | PLMN2 |
| - PLMN Identity List | |
| - PLMN Identity | PLMN2 |

RRC CONNECTION SETUP COMPLETE (step 8)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

RRC CONNECTION SETUP COMPLETE (step 20)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | True |

UE INFORMATION RESPONSE (FDD) (Step 22)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of |

| Information Element | Value/remark |
|---|---|
| | the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - PLMN Identity | PLMN2 |
| - Cell ID[x] | Cell 3 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 22)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - PLMN Identity | PLMN2 |
| - Cell ID | Cell 3 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

8.6.2.4a.5 Test requirements

At step 8, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present (TP2).

At step 20, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available" (TP1).

At step 22, the UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 3(TP1).

## 8.6.2.5 Logged MDT / Release of logged MDT measurement configuration / Expire of duration timer

### 8.6.2.5.1 Definition

### 8.6.2.5.2 Conformance requirement

[TS 25.331, clause 8.5.63.3 (TP1, TP2)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

1> if IE "Logged Measurements Configuration Info" is present:

2> if stored, discard the existing logged measurement configuration as well as the logged measurement information as specified in 8.5.66;

2> store the received IEs "Logging Duration", "Logging Interval", "Area Configuration" if included in IE "Logged Measurements Configuration Info" in variable LOGGED_MEAS_CONFIG and IEs "Absolute Time Info", "Trace reference", "Trace recording session" and "TCE Id" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> start timer T326 with the timer value set to the IE "Logging Duration".

NOTE: The UE shall not stop timer T326 unless explicitly stated when it moves to another RAT.

1> if IE "Logged ANR configuration Info" is present:

2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.68;

2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

2> store the list of Equivalent PLMNs in the IE "Equivalent PLMN Identity List" in variable LOG_ANR_REPORT_VARIABLE;

2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements has been configured, the UE shall:

1> Store the available measurements according to the logged measurements configuration in LOGGED_MEAS_CONFIG variable as specified in subclause 8.5.65.2.

[TS 25.331, clause 8.5.63.4 (TP1)]

When timer T326 expires, the UE shall:

1> release variable LOGGED_MEAS_CONFIG.

The UE is allowed to release stored logged measurements, i.e. to release LOGGED_MEAS_REPORT_VARIABLE 48 hours after T326 expiry.

[TS 25.331, clause 8.5.64.3 (TP2)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

   2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable
   LOGGED_MEAS_REPORT_VARIABLE:

      3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable
      LOGGED_MEAS_REPORT_VARIABLE is present:

         10> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

            5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the
            variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable
            LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in
            the variable LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable
            LOGGED_MEAS_REPORT_VARIABLE;

            5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it
            to include, in the same order as logged, one or more entries from
            LOGGED_MEAS_REPORT_VARIABLE;

            5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD"
            or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

            5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

               6> include IE "Logged Meas Available";

   2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

1> if IE "Logged ANR Report Request" is present:

   2> if Registered PLMN is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN
   Identity List" stored in variable LOG_ANR_REPORT_VARIABLE:

      3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:

         4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:

            5> include the IEs "Logged ANR Report Info List" and set it to include entries from
            LOG_ANR_REPORT_VARIABLE;

            5> clear the logged measurement results included in the list of IEs " Logged ANR Report Info List"
            from the LOG_ANR_REPORT_VARIABLE;

            5> clear the variable LOG_ANR_CONFIG and stop timer T327.

   2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 25.331, clause 8.5.65.2 (TP1, TP2)]

While T326 is running, the UE shall:

   1> perform this logging in accordance with the following:

      2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the
      PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is
      present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

      2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable
      LOGGED_MEAS_CONFIG;

      2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

         3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

         3> if GNSS location information became available during the last logging interval:

            4> if the UE has been able to calculate a 3-dimensional position:

               5> set IE "Ellipsoid point with altitude" to include the location coordinates;

            4>else:

               5> set IE "Ellipsoid point" to include the location coordinates:

         3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

         3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

         3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

         3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

         3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

    NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

      2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

### Reference

3GPP TS 25.331 clauses 8.5.63.3, 8.5.63.4, 8.5.64.3 and 8.5.65.2

### 8.6.2.5.3 Test Purpose

1. Verify release of Logged MDT measurement configuration up on stop or expire of logging duration timer.

2. Verify that UE, when being requested to report logged MDT measurements before the duration timer has expired, deletes the reported logged MDT measurements.

### 8.6.2.5.4 Method of test

#### Initial Condition

System Simulator: Cell 1 is active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

#### Test Procedure

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 5s to allow UE to activate logging.

SS request Logged Meas Report until all the Logged Meas Report has been transmitted.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, without IE "Logged Meas Report ".

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 10 minutes for UE performing the logging at regular time intervals as to ensure timer T326 has expired.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS request Logged Meas Report until all the Logged Meas Report has been transmitted.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode.

Wait 10 s.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and without IE "Logged Meas Available"

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | **UE** | **SS** | | |
| 1 | ← | | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | ← | | RRC CONNECTION RELEASE | |
| 3 | → | | RRC CONNECTION RELEASE COMPLETE | |
| 4 | | | | Wait 5s to allow UE to active logging. |
| 5 | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 6 | ← | | RRC CONNECTION SETUP | |
| 7 | → | | RRC CONNECTION SETUP COMPLETE | |
| 8 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 9 | → | | UE INFORMATION RESPONSE | |
| | | | | EXCEPTION: In case the IE "Logged Meas Available" present in IE "Logged Meas Report" in message UE INFORMATION RESPONSE in step 9, steps 9a1 and 9a2 will be executed. |

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
|      | UE | SS |         |         |
| 9a1  | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 9a2  | → | | UE INFORMATION RESPONSE | |
|      |   | | | EXCEPTION: In case the IE "Logged Meas Available" present in IE "Logged Meas Report" in message UE INFORMATION RESPONSE in step 9a2, steps 9a1 and 9a2 will be executed again. |
| 10   | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 11   | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, without IE "Logged Meas Report". |
| 12   | ← | | RRC CONNECTION RELEASE | |
| 13   | → | | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 14   |   | | | Wait 10 min for UE performing the logging at regular time intervals as to ensure timer T326 has expired. |
| 15   | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 16   | ← | | RRC CONNECTION SETUP | |
| 17   | → | | RRC CONNECTION SETUP COMPLETE | |
| 18   | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 19   | → | | UE INFORMATION RESPONSE | The UE sends a UE INFORMATION RESPONSE message; include IE "Logged Meas Report" of Cell 1. |
|      |   | | | EXCEPTION: In case the IE "Logged Meas Available" present in IE "Logged Meas Report" in message UE INFORMATION RESPONSE in step 19, steps 19a1 and 19a2 will be executed. |
| 19a1 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 19a2 | → | | UE INFORMATION RESPONSE | |
|      |   | | | EXCEPTION: In case the IE "Logged Meas Available" present in IE "Logged Meas Report" in message UE INFORMATION RESPONSE in step 19a2, steps 19a1 and 19a2 will be executed again. |
| 20   | ← | | RRC CONNECTION RELEASE | |
| 21   | → | | RRC CONNECTION RELEASE COMPLETE | |
|      |   | | Void | Wait 10s. |

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 22 | → | | RRC CONNECTION REQUEST | |
| 23 | ← | | RRC CONNECTION SETUP | |
| 24 | → | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit a RRC CONNECTION SETUP COMPLETE message, without IE "Logged Meas Available". |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.56 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

UE INFORMATION REQUEST (Step 8 and 10)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |

| Information Element | Value/remark |
|---|---|
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (TDD) (Step 9)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (FDD) (Step 9a2)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |

| Information Element | Value/remark |
|---|---|
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (TDD) (Step 9a2)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |

| Information Element | Value/remark |
|---|---|
| Logged Meas Report | Not present |

UE INFORMATION RESPONSE (FDD) (Step 19)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (TDD) (Step 19)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |

| Information Element | Value/remark |
|---|---|
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (FDD) (Step 19a2)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not present or TRUE |

UE INFORMATION RESPONSE (TDD) (Step 19a2)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |

| Information Element | Value/remark |
|---|---|
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
|   - Cell ID | Cell 1 |
|   - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not present or TRUE |

RRC CONNECTION SETUP COMPLETE (step 24)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

8.6.2.5.5 Test requirement

At step 11, the UE shall send an UE INFORMATION RESPONSE message, without IE "Logged Meas Report" (TP2).

At step 24, the UE shall transmit a RRC CONNECTION SETUP COMPLETE message, without IE "Logged Meas Available" (TP1).

## 8.6.2.6 Logged MDT / Release of logged MDT measurement configuration / Reception of new logged measurement configuration, Detach or UE power off

8.6.2.6.1 Definition

8.6.2.6.2 Conformance requirement

[TS 25.331, clause 8.5.63.3 (TP1, TP2)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

1> if IE "Logged Measurements Configuration Info" is present:

2> if stored, discard the existing logged measurement configuration as well as the logged measurement information as specified in 8.5.66;

2> store the received IEs "Logging Duration", "Logging Interval", "Area Configuration" if included in IE "Logged Measurements Configuration Info" in variable LOGGED_MEAS_CONFIG and IEs "Absolute Time Info", "Trace reference", "Trace recording session" and "TCE Id" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> start timer T326 with the timer value set to the IE "Logging Duration".

NOTE: The UE shall not stop timer T326 unless explicitly stated when it moves to another RAT.

1> if IE "Logged ANR configuration Info" is present:

2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.68;

2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

2> store the list of Equivalent PLMNs in the IE "Equivalent PLMN Identity List" in variable LOG_ANR_REPORT_VARIABLE;

2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements has been configured, the UE shall:

1> Store the available measurements according to the logged measurements configuration in LOGGED_MEAS_CONFIG variable as specified in subclause 8.5.65.2.

[TS 25.331, clause 8.5.66.2 (TP1, TP2)]

The UE initiates the procedure upon receiving a logged measurement configuration in UTRAN or in another RAT. The UE also shall initiate the procedure upon switch off or detach.

The UE shall:

1> if stored, discard the existing logged measurement configuration as well as the logged measurement information, i.e. release the UE variables LOGGED MEAS CONFIG and LOGGED_MEAS_REPORT_VARIABLE and stop timer T326.

Reference

TS 25.331 clauses 8.5.63.3, 8.5.66.2

### 8.6.2.6.3 Test Purpose

1. Verify release of logged measurement configuration and logs up on reception of new logged measurement configuration

2. Verify release of logged measurement configuration and logs upon UE switch off or detach

### 8.6.2.6.4 Method of test

Initial Condition

System Simulator: Cell 1 is active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

Related ICS/IXIT statement(s)

Switch off button Yes/No.

Test Procedure

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 10s to allow UE to activate logging.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, without IE "Logged Meas Report ".

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 10s to allow UE to activate logging.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, without IE "Logged Meas Report" based on the message LOGGING MEASUREMENT CONFIGURATION in step 1.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode.

Wait 10s to allow UE to activate logging.

The UE is switched off, or detaches from the network.

The UE is switched on, or attaches to the network.

The UE registered on the network.

Wait 10s

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and without IE "Logged Meas Available"

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----------|---------|---------|
| | **UE** | **SS** | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | | ← | RRC CONNECTION RELEASE | |
| 3 | → | | RRC CONNECTION RELEASE COMPLETE | |
| 4 | | | | Wait 10s to allow UE to activate logging. |
| 5 | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 6 | | ← | RRC CONNECTION SETUP | |
| 7 | → | | RRC CONNECTION SETUP COMPLETE | |
| 8 | | ← | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 9 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 10 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, without IE "Logged Meas Report". |
| 11 | ← | | RRC CONNECTION RELEASE | |
| 12 | → | | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 13 | | | | Wait 10s to allow UE to activate logging. |
| 14 | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 15 | ← | | RRC CONNECTION SETUP | |
| 16 | → | | RRC CONNECTION SETUP COMPLETE | |
| 17 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 18 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, with IE "Logged Meas Report" present. And the IE "Logged Meas Report" does not include logged measurement reports based on the message LOGGING MEASUREMENT CONFIGURATION in step 1. |
| 19 | ← | | RRC CONNECTION RELEASE | |
| 20 | → | | RRC CONNECTION RELEASE COMPLETE | |
| 21 | | | | Wait 10s to allow UE to activate logging. |
| 22 | | | | The UE is powered down or switched off and initiates a detach. |
| 23 | | | | The UE is powered up or switched on and initiates an attach. |
| 24-36 | | | | Steps 1 to 13 of the generic test procedure in TS 34.108 subclause 7.2.2.2.3 are performed to complete the registration on the network. |
| 37 | | | | Wait 10s to allow UE to activate logging. |
| 38 | → | | RRC CONNECTION REQUEST | |
| 39 | ← | | RRC CONNECTION SETUP | |
| 40 | → | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit a RRC CONNECTION SETUP COMPLETE message, without IE "Logged Meas Available". |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1 and 8)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.56 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

RRC CONNECTION SETUP COMPLETE (step 7)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | TRUE |

UE INFORMATION REQUEST (Steps 9 and 17)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (Step 10)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | Not present |

UE INFORMATION RESPONSE (FDD) (Step 18)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. |

| Information Element | Value/remark |
|---|---|
| | The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |

UE INFORMATION RESPONSE (TDD) (Step 18)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 8 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |

RRC CONNECTION SETUP COMPLETE (step 40)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

8.6.2.6.5                    Test requirement

At step 10, the UE shall send a UE INFORMATION RESPONSE message, without IE "Logged Meas Report" (TP1).

At step18, the UE shall send a UE INFORMATION RESPONSE message, with IE "Logged Meas Report". And the IE "Logged Meas Report" does not include logged measurement reports based on the message LOGGING MEASUREMENT CONFIGURATION in step 1. (TP1).

At step 40, the UE shall transmit a RRC CONNECTION SETUP COMPLETE message, without IE "Logged Meas Available" (TP2).

## 8.6.2.7      Logged MDT / Maintaining logged measurement configuration / UE state transitions and mobility

8.6.2.7.1                    Definition

8.6.2.7.2                    Conformance requirement

[TS 25.304, clause 5.7 (TP1, TP2, TP3, TP4)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

-    the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

-    RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

-    the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

-    the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

   NOTE:    Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.5.65.2 (TP2, TP3, TP4)]

While T326 is running, the UE shall:

  1>  perform this logging in accordance with the following:

    2>  perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_ VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

    2>  perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

    2>  when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

      3>  set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

      3>  if GNSS location information became available during the last logging interval:

        4>  if the UE has been able to calculate a 3-dimensional position:

          5>  set IE "Ellipsoid point with altitude" to include the location coordinates;

4>else:

 5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

[TS 25.331, clause 13.4.48 (TP2, TP3, TP4)]

This variable contains parameters related to Logged Measurements. This variable shall not be deleted upon transition to idle mode and when the UE moves to another RAT.

| Information Element/Group name | Need | Multi | Type and reference | Semantics description | Version |
|---|---|---|---|---|---|
| Logged Measurements Configuration Info | MP | | Logged Measurements Configuration Info 10.3.7.132 | | REL-10 |

[TS 25.331, clause 13.4.49 (TP2, TP3, TP4)]

This variable includes the logged measurements information. This variable shall not be deleted upon transition to Idle mode and when the UE moves to another RAT. The UE shall store the logged measurements during 48 hours after expiry of the timer T326.

| Information Element/Group name | Need | Multi | Type and reference | Semantics description | Version |
|---|---|---|---|---|---|
| Trace reference | MP | | Trace Reference 10.3.7.133 | Parameter trace reference: See TS 32.422 [81] | REL-10 |
| Trace recording session | MP | | Trace Recording Session 10.3.7.134 | Parameter trace recording session reference: See TS 32.422 [81] | REL-10 |
| TCE Id | MP | | TCE Id 10.3.7.135 | Parameter TCE Id: See TS 32.422 [81] | REL-10 |
| PLMN Identity | MP | | PLMN identity 10.3.1.11 | | REL-10 |
| Absolute Time Info | MP | | Bit Sting (48) | Indicates the reference to network absolute time | REL-10 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | *absoluteTimeInfo* provided at the point of measurement logging configuration. Format is YY-MM-DD HH:MM:SS using BCD encoding | |
| CHOICE mode | MP | | | | REL-10 |
| >FDD | | | | | REL-10 |
| >>List of measurements FDD | | 0..MaxLoggedMeas | | | REL-10 |
| >>>Logged Measurement Info-FDD | MP | | Logged Measurement Info-FDD 10.3.7.129 | | REL-10 |
| >TDD | | | | | REL-10 |
| >>List of measurements TDD | | 0..MaxLoggedMeas | | | REL-10 |
| >>>Logged Measurement Info-TDD | MP | | Logged Measurement Info-TDD 10.3.7.130 | | REL-10 |

Reference

TS25.304 clause 5.7 and TS 25.331 clauses 8.5.65.2, 13.4.48, 13.4.49

8.6.2.7.3 Test Purpose

1. Verify that UE is not indicating availability of Logged MDT measurements when UE has moved to a non MDT PLMN cell

2. Verify that logged measurement configurations and logs are maintained despite periods of interruptions due to UE transitions to CELL_FACH or CELL_DCH

3. Verify that logged measurement configurations and logs are maintained despite periods of interruptions due to UE change to a non MDT PLMN cell

4. Verify that logging is stopped (but duration timer is kept running) when UE changes from "camp normally" state to "any cell selection" or "camp on any cell" states and resumes logging when returning to "camp normally" state

8.6.2.7.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 2.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

Table 8.6.2.7 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial condition. Subsequent configurations marked "T1", "T2", "T3" and "T4" are applied at the points indicated described in the texts in this clause.

**Table 8.6.2.7**

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 3 |
|---|---|---|---|---|---|
| | UTRA RF Channel Number | | Mid Range Test Frequency | Mid Range Test Frequency | Mid Range Test Frequency |
| | PLMN | | PLMN 1 | PLMN 2 | PLMN 1 |

| T0 | CPICH Ec (FDD) | dBm/3.84MHz | -60 | Off | Off |
|----|----------------|-------------|-----|-----|-----|
|    | P-CCPCH RSCP (TDD) | dBm | -60 | Off | Off |
| T1 | CPICH Ec (FDD) | dBm/3.84MHz | -69 | -60 | Off |
|    | P-CCPCH RSCP (TDD) | dBm | -69 | -60 | Off |
| T2 | CPICH Ec (FDD) | dBm/3.84MHz | Off | -69 | -60 |
|    | P-CCPCH RSCP (TDD) | dBm | Off | -69 | -60 |
| T3 | CPICH Ec (FDD) | dBm/3.84MHz | Off | Off | Off |
|    | P-CCPCH RSCP (TDD) | dBm | Off | Off | Off |
| T4 | CPICH Ec (FDD) | dBm/3.84MHz | Off | Off | -60 |
|    | P-CCPCH RSCP (TDD) | dBm | Off | Off | -60 |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to CELL_PCH.

The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message and enters CELL_PCH state.

Wait 10s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T1" in table 8.6.2.7.

When the UE detects the presence of cell 2, it moves to CELL_FACH state and transmits a CELL UPDATE message without IE "Logged Meas Available".

Upon reception of CELL_UPDATE message, SS replies with a CELL UPDATE CONFIRM message, the IE "RRC State Indicator" set to "CELL_PCH".

Wait 10s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T2" in table 8.6.2.7.

When the UE detects the presence of cell 3, it moves to CELL_FACH state and transmits a CELL UPDATE message with IE "Logged Meas Available".

Upon reception of CELL_UPDATE message, SS replies with a CELL UPDATE CONFIRM message.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode.

Wait 10s to allow UE to activate logging.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, with IE "Logged Meas Report" including logged report of Cell 1 and Cell 3.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 10s to allow UE to activate logging.

SS configures its downlink transmission power settings according to columns "T3" in table 8.6.2.7.

Wait 30s.

SS configures its downlink transmission power settings according to columns "T4" in table 8.6.2.7.

Wait 10s to allow UE to activate logging.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, with IE "Logged Meas Report" of Cell 2.

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | | ← | PHYSICAL CHANNEL RECONFIGURATION | The IE "RRC state indicator" is set to "CELL_PCH". |
| 3 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 10s to allow UE to activate logging. |
| 5 | | | | SS configures its downlink transmission power settings according to columns "T1" in table 8.6.2.7. |
| 6 | → | | CELL UPDATE | The UE moves to CELL_FACH state and transmits this message without the IE "Logged Meas Available" on Cell 2. |
| 7 | | ← | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_PCH". |
| 8 | | | | Wait 10s to allow UE to activate logging. |
| 9 | | | | SS configures its downlink transmission power settings according to columns "T2" in table 8.6.2.7. |
| 10 | → | | CELL UPDATE | The UE moves to CELL_FACH state and transmits this message with the IE "Logged Meas Available" on Cell 3. |

| Step | Direction | | Message | Comment |
|------|------|------|---------|---------|
| | UE | SS | | |
| 11 | ← | | CELL UPDATE CONFIRM | IE "RRC State Indicator" is set to "CELL_DCH". |
| 12 | ← | | RRC CONNECTION RELEASE | |
| 13 | → | | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 14 | | | | Wait 10s to allow UE to activate logging. |
| 15 | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 16 | ← | | RRC CONNECTION SETUP | |
| 17 | → | | RRC CONNECTION SETUP COMPLETE | |
| 18 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 19 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, with IE "Logged Meas Report" including logged report of Cell1 and Cell 3. |
| 20 | | | | Wait 10s to allow UE to activate logging. |
| 21 | | | | SS configures its downlink transmission power settings according to columns "T3" in table 8.6.2.7. |
| 22 | | | | Wait 30s to allow UE to activate logging. |
| 23 | | | | SS configures its downlink transmission power settings according to columns "T4" in table 8.6.2.7. |
| 24 | | | | Wait 10s to allow UE to activate logging. |
| 25 | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 26 | ← | | RRC CONNECTION SETUP | |
| 27 | → | | RRC CONNECTION SETUP COMPLETE | |
| 28 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 29 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, with IE "Logged Meas Report" including logged report of Cell 3. |

Specific Message Contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |

| Logged Measurements Configuration Info | |
|---|---|
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.62 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

CELL UPDATE (Step 6)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| Cell Update Cause | 'Cell Re-selection' |
| Logged Meas Available | Not present |

CELL UPDATE (Step 10)

Use the message sub-type in default message content defined in 3GPP TS 34.108 [9] clause 9, with the following exceptions.

| Information Element | Value/remark |
|---|---|
| Cell Update Cause | 'Cell Re-selection' |
| Logged Meas Available | TRUE |

UE INFORMATION REQUEST (Steps 18 and 28)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 19)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT |

| Information Element | Value/remark |
|---|---|
| | CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least one entry complies to entry with index 'x' below for cell 1 and at least one entry complies to entry with index 'y' below for cell 3. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurement Info-FDD[y] | |
| - Relative Time Stamp[y] | Not checked |
| - Logged Measurements Serving Cell[y] | |
| - Cell ID | Cell 3 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 19)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least one entry complies to entry with index 'x' below for cell 1 and at least one entry complies to entry with index 'y' below for cell 3. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurement Info-TDD[y] | |
| - Relative Time Stamp[y] | Not checked |
| - Logged Measurements Serving Cell[y] | |
| - Cell ID | Cell 3 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (FDD) (Step 29)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. |

| Information Element | Value/remark |
|---|---|
| | The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least one entry complies to entry with index 'x' below for cell 3 and the number of entries shall no more than 20/2.56. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 3 |
| - Primary CCPCH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 29)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least one entry complies to entry with index 'x' below for cell 3 and the number of entries shall no more than 20/2.56. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 3 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

8.6.2.7.5          Test requirement

At step 6, the UE shall transmit a CELL UPDATE message without the IE "Logged Meas Available" on Cell 2 (TP1).

At step 10, the UE shall transmit a CELL UPDATE message with the IE "Logged Meas Available" set as TRUE on Cell 3 (TP3).

At step 19, the UE shall transmit a UE INFORMATION RESPONSE message, with IE "Logged Meas Report" including logged report of Cell1 and Cell 3 (TP2).

At step 29, the UE shall transmit a UE INFORMATION RESPONSE message, with IE "Logged Meas Report" including logged report of Cell 3. And the number of entries in the List of measurements FDD or TDD shall be no more than the expected logged measurement result entries within 20 seconds of logging periods (TP4).

## 8.6.2.8        Logged MDT / Reporting / Location information

### 8.6.2.8.1          Definition

### 8.6.2.8.2          Conformance requirement

[TS 25.331, clause 8.5.65.2]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4> else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE:    The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

3GPP TS 25.331 clause 8.5.65.2.

8.6.2.8.3 Test Purpose

1. Verify presence of location information in Logged MDT measurement reports.

8.6.2.8.4 Method of test

Initial Condition

System Simulator: 2 cells, Cell 1 and Cell 2 are active.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

The UE's positioning engine (e.g. standalone GNSS receiver) should be provided with any necessary stimulus to allow it to provide the position. This shall be done by use of the test function Update UE Location Information defined in TS 34.109 [10], if supported by the UE according to pc_UpdateUE_LocationInformation. Otherwise, or in addition any other suitable method may also be used.

Test Procedure

Same as the test procedure in subclause 8.2.6.1.4

Specific Message Contents

All messages have the same content as the specific messages in clause 8.2.6.1.4 with the following exceptions:

UE INFORMATION RESPONSE (FDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Checked to be present with a value bigger than 0. |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Primary CPICH info | Set to the scrambling code for cell 2 |
| - CPICH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - CHOICE *GNSS UE Position* | Ellipsoid or Ellipsoid with altitude |
| - Ellipsoid point | If CHOICE *GNSS UE Position* is 'Ellipsoid' then check to be present |
| - Ellipsoid point with altitude | If CHOICE *GNSS UE Position* is 'Ellipsoid with altitude' then check to be present |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Checked to be present with a value bigger than 0. |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Intra Frequency list[x] | Only 1 intra Frequency cell |
| - Cell parameters Id | Cell parameter Id of Cell 2 |
| - Primary CCPCH RSCP | (0..91) |
| - CHOICE *GNSS UE Position* | Ellipsoid or Ellipsoid with altitude |
| - Ellipsoid point | If CHOICE *GNSS UE Position* is 'Ellipsoid' then check to be present |
| - Ellipsoid point with altitude | If CHOICE *GNSS UE Position* is 'Ellipsoid with altitude' then check to be present |
| - Logged Meas Available | Not checked |

### 8.6.2.8.5 Test requirement

Test step numbers as per expected sequence table in subclause 8.6.2.1.4.

At step 12 the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 2 in the "Logged Measurements Intra Frequency Neighbouring Cells list" with the IE Ellipsoid point or IE Ellipsoid point with altitude present (TP1).

## 8.6.2.9 Logged MDT / Logging and reporting / PLMN list / PLMN change

### 8.6.2.9.1 Definition

This test is applicable for all UEs that support Enhancement of Logged MDT services.

### 8.6.2.9.2 Conformance requirement

[TS25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- the RPLMN of the UE is present in the MDT PLMN identity list, if received in the LOGGING MEASUREMENT CONFIGURATION message, or the RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS25.331, clause 8.1.3.6 (TP1,TP2)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

1> ignore the rest of the message.

If the values are identical, the UE shall:

...

1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...


[TS 25.331, clause 8.5.65.2 (TP1, TP2)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is present in the "PLMN Identity List" stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

4>else:

5> set IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

4> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

3> set the IE "PLMN Identity" of the Logged Measurements Serving Cell to indicate the PLMN Identity of the cell the UE is camping on obtained from system information;

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.3.1.6, 8.5.65.2

### .8.6.2.9.3 Test Purpose

1. Verify that IE "Logged Meas Available" is not indicated in the cell that does not belong to the PLMN included in LOGGING MEASUREMENT CONFIGURATION message.

2. Verify that IE "Logged Meas Available" is indicated in the cell that belongs to the PLMN included in LOGGING MEASUREMENT CONFIGURATION message.

### 8.6.2.9.4 Method of test

Initial conditions

System Simulator:

3 cells, cell 1, cell 2 and cell 3.

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test procedure

Table 8.6.2.9.4-1 illustrates the downlink power to be applied for the 3 cells. Column marked "T0" denotes the initial conditions, while columns marked "T1", "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the text in this clause.

| Parameter | Unit | Cell 1 | | | Cell 2 | | | Cell 3 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T0 | T1 | T2 | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | Mid Range Test Frequency | | | Mid Range Test Frequency | | |
| CPICH Ec (FDD) | dBm/3.84 MHz | -60 | OFF | OFF | OFF | -60 | OFF | OFF | OFF | -60 |
| P-CCPCH RSCP(TDD) | dBm | -60 | OFF | OFF | OFF | -60 | OFF | OFF | OFF | -60 |
| PLMN | | PLMN 1 | | | PLMN 2 | | | PLMN 3 | | |

a)  SS transmits a LOGGING MEASUREMENT CONFIGURATION message with a cell list on Cell 1 and only Cell 3 in the configured cell list. SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 2. Verify Logging MDT measurements on Cell 2.

b)  SS changes Cell 1, Cell 2 and Cell 3 level, and the UE moves to idle mode on Cell 3. Verify Logging MDT measurements on Cell 3.

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | <-- | | LOGGING MEASUREMENT CONFIGURATION | SS transmit a LOGGING MEASUREMENT CONFIGURATION message with a cell list on Cell 1. Only Cell 3 in configured cell list. |
| 2 | <-- | | RRC CONNECTION RELEASE | SS transmit a RRC CONNECTION RELEASE message to release the RRC connection. |
| 3 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode. |
| 4 | - | - | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 5 | - | - | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T1 in Table 8.6.2.9.4-1. |
| 6 | - | - | | UE select PLMN 2 and Cell2. Call PS Registration procdeure in TS34.108 clause 7.2.2.2.3 on cell 2, and enter idle mode. |
| 7 | - | - | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 8 | <-- | | Paging | SS transmits a Paging message. |
| 9 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 10 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 11 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present. |
| 12 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release the RRC connection. |
| 13 | --> | | RRC CONNECTION RELEASE COMPLETE | The UE confirms the connection release and returns to Idle mode. |
| 14 | - | - | | SS changes Cell 1, Cell 2 and Cell 3 level according to the T2 in Table 8.6.2.9.4-1. |
| 15 | - | - | | UE select PLMN 3 and Cell3. Call PS Registration procdeure in TS34.108 clause 7.2.2.2.3 on cell 3, and enter idle mode. |
| 16 | | | | Wait 10 seconds for UE logging interval timer to expire at least once |
| 17 | <-- | | Paging | SS transmits a Paging message. |
| 18 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 19 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 20 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available". |
| 21 | <-- | | UE INFORMATION REQUEST | SS send an UE INFORMATION REQUEST message to get logMeasReport. |

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | **UE** | **SS** | | |
| 22 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 3. |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.59 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |
| - PLMN Identity List | |
| - PLMN Identity | PLMN3 |

RRC CONNECTION SETUP COMPLETE (step 11)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | Not present |

RRC CONNECTION SETUP COMPLETE (step 20)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Logged Meas Available | True |

UE INFORMATION RESPONSE (FDD) (Step 22)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |

| Information Element | Value/remark |
|---|---|
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
|  - List of measurements FDD | At least 2 entry where at least one entry complies to entry with index 'x' and at least one entry with index 'y' below. |
|   - Logged Measurement Info-FDD[x] | |
|   - Relative Time Stamp[x] | Not checked |
|   - Logged Measurements Serving Cell[x] | |
|    - PLMN Identity | PLMN1 |
|    - Cell ID | Cell 1 |
|    - Primary CCPCH RSCP | (0..91) |
|    - CPICH Ec/N0 | (0..49) |
|   - Logged Measurement Info-FDD[y] | |
|   - Relative Time Stamp[y] | Not checked |
|   - Logged Measurements Serving Cell[y] | |
|    - PLMN Identity[y] | PLMN3 |
|    - Cell ID | Cell 3 |
|    - Primary CCPCH RSCP | (0..91) |
|    - CPICH Ec/N0 | (0..49) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 22)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|  - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|  - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|  - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - CHOICE mode | TDD |
|  - List of measurements TDD | At least 2 entry where at least one entry complies to entry with index 'x' and at least one entry with index 'y' below. |
|   - Logged Measurement Info-TDD[x] | |
|   - Relative Time Stamp[x] | Not checked |
|   - Logged Measurements Serving Cell[x] | |
|    - PLMN Identity | PLMN1 |
|    - Cell ID | Cell 1 |
|    - Primary CCPCH RSCP | (0..91) |
|   - Logged Measurement Info-TDD[y] | |
|   - Relative Time Stamp[y] | Not checked |
|   - Logged Measurements Serving Cell[y] | |
|    - PLMN Identity | PLMN3 |
|    - Cell ID | Cell 3 |

| Information Element | Value/remark |
|---|---|
| - Primary CCPCH RSCP | (0..91) |
| - Logged Meas Available | Not checked |

#### 8.6.2.9.5 Test requirements

At step 11, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message with IE "Logged Meas Available" not present (TP1).

At step 20, the UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Logged Meas Available" (TP2).

At step 22, the UE shall send an UE INFORMATION RESPONSE message with Logged Meas Report of Cell 1 and Cell 3(TP2).

### 8.6.3.1 Logged MDT / E-UTRAN Inter-RAT measurement, logging and reporting / Idle mode

#### 8.6.3.1.1 Definition

#### 8.6.3.1.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.5.64.3 (TP1)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

   2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

      3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

      11> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

         5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

         5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

6> include IE "Logged Meas Available";

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

1> if IE "Logged ANR Report Request" is present:

2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE:

3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:

4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:

5> include the IEs "Logged ANR Report Info List" and set it to include entries from LOG_ANR_REPORT_VARIABLE;

5> clear the logged measurement results included in the list of IEs "Logged ANR Report Info List" from the LOG_ANR_REPORT_VARIABLE;

5> clear the variable LOG_ANR_CONFIG and stop timer T327.

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 25.331, clause 8.5.65 (TP1)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements has been configured, the UE shall:

1> Store the available measurements according to the logged measurements configuration in LOGGED_MEAS_CONFIG variable as specified in subclause 8.5.65.2.

[TS 25.331, clause 8.5.65.2 (TP1)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4>else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

Reference

TS25.304 clause 5.7, TS 25.331 clauses 8.5.64., 8.5.65 and 8.5.65.2.

8.6.3.1.3 Test Purpose

1. Verify logging and reporting of Logged MDT E-UTRAN Inter-RAT measurements

8.6.3.1.4 Method of test

System Simulator: 1 UTRAN FDD cell (or TDD cell) and 1 E-UTRAN cell. Cell 1 is a UTRAN cell, and Cell 2 is an E-UTRAN Cell. Cell 2 configuration refers to "Cell 1" in TS36.508 clause 6.3. SIB configuration 6 is applied in accordance with TS 34.108 clause 6.1.0a.2.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1as specified in clause 7.4 of TS 34.108.

Related ICS/IXIT statements

- Compressed mode required yes/no

- UE supports E-UTRAN.

Test Procedure

Table 8.6.3.1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial condition, while column marked "T1" and "T2" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

**Table 8.6.3.1: Time instances of cell power level and parameter changes**

|  | Parameter | Unit | Cell 1(UTRA) | Cell 2(E-UTRA) |
|---|---|---|---|---|
|  | Cell-specific RS EPRE | dBm/15kHz | - | -90 |
| T0 | CPICH Ec (UTRA FDD) | dBm/3.84 MHz | -65 | - |
|  | PCCPCH Ec(UTRA LCR TDD) | dBm/1.28 MHz | -65 | - |
| T1 | Cell-specific RS EPRE | dBm/15kHz | - | -70 |

| | CPICH Ec (UTRA FDD) | dBm/3.84 MHz | -100 | - |
|---|---|---|---|---|
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.28 MHz | -100 | - |
| T2 | Cell-specific RS EPRE | dBm/15kHz | - | -90 |
| | CPICH Ec (UTRA FDD) | dBm/3.84 MHz | -65 | - |
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.28 MHz | -65 | - |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 10s to allow UE to activate logging.

SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.3.1. The UE shall find that the cell 2 is better and attempt to perform a cell reselection.

UE reselects to cell 2 and moves to RRC_IDLE.

SS applies the downlink transmission power settings, according to the values in columns "T2" of table 8.6.3.1. The UE shall find that the cell 1 is better and attempt to perform a cell reselection.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, with IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD". And Logged Measurements of Cell 2 is in the Logged Measurements inter RAT Neighbouring Cells list".

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Expected Sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | ← | | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | ← | | RRC CONNECTION RELEASE | |
| 3 | → | | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 10s to allow UE to activate logging. |

| Step | Direction | | Message | Comment |
|------|-----------|------|---------|---------|
| | UE | SS | | |
| 5 | - | | - | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.3.1. The UE shall find that the cell 2 is better and attempt to perform a cell reselection. |
| 6 | - | | - | Call generic procedure in 36.508 subclause 6.4.2.7A-1, UE reselcts to cell 2. The UE performs a TAU procedure and the RRC Connection is released. |
| 7 | - | | - | SS applies the downlink transmission power settings, according to the values in columns "T2" of table 8.6.3.1. The UE shall find that the cell 1 is better and attempt to perform a cell reselection. |
| 8 | | | | Wait for random access requests from the UE on Cell 1. |
| 9 | <-- | | Paging | SS transmits a Paging message on Cell 1. |
| 10 | → | | RRC CONNECTION REQUEST | |
| 11 | ← | | RRC CONNECTION SETUP | |
| 12 | → | | RRC CONNECTION SETUP COMPLETE | |
| 13 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 14 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message. And Logged Measurements of Cell 2 is in the Logged Measurements E-UTRA frequency list. |
| 15 | ← | | RRC CONNECTION RELEASE | |
| 16 | → | | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |

Specific Message Contents

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |

| | |
|---|---|
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.63 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

UE INFORMATION REQUEST (Step 13)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 14)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurements E-UTRA frequency list | 1 entry |
| - E-UTRA Carrier Frequency | Same as cell 2 |
| - Logged Measurements E-UTRA Frequency Neighbours List | 1 entry |
| - Physical Cell Identity | Same as cell 2 |
| - RSRP | (0..97) |
| - RSRQ | (0..34) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 14)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Inter-RAT Neighbour cells list | |
| - Logged Measurements E-UTRA frequency list | 1 entry |
| - E-UTRA Carrier Frequency | Same as cell 2 |
| - Logged Measurements E-UTRA Frequency Neighbours List | 1 entry |
| - Physical Cell Identity | Same as cell 2 |
| - RSRP | (0..97) |
| - RSRQ | (0..34) |
| - Logged Meas Available | Not checked |

### 8.6.3.1.5 Test requirement

At step 14, the UE shall transmit a UE INFORMATION RESPONSE message, with IE "Logged Measurements Inter-RAT Neighbour cells list" include Logged Measurements of Cell 2 (TP1).

## 8.6.3.2 Logged MDT / GERAN Inter-RAT measurement, logging and reporting / Idle mode

### 8.6.3.2.1 Definition

### 8.6.3.2.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.5.65.2 (TP1)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4> else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

[TS 25.331, clause 8.5.64.3 (TP1)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

   3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

      12> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

         5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

         5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

         5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

         5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

         5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

         5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

         5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

           6> include IE "Logged Meas Available";

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

1> if IE "Logged ANR Report Request" is present:

  2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE:

   3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:

    4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:

      5> include the IEs "Logged ANR Report Info List" and set it to include entries from LOG_ANR_REPORT_VARIABLE;

      5> clear the logged measurement results included in the list of IEs " Logged ANR Report Info List" from the LOG_ANR_REPORT_VARIABLE;

      5> clear the variable LOG_ANR_CONFIG and stop timer T327.

2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 37.320, clause 5.1.1.3.1 (TP1)]

A UE configured to perform Logged MDT measurements indicates the availability of Logged MDT measurements, by means of an indicator, in RRCConnectionSetupComplete message during connection establishment. Furthermore, the indicator (possibly updated) shall be provided within E-UTRAN handover and re-establishment, and UTRAN procedures involving the change of SRNC (SRNC relocation), CELL UPDATE, URA UPDATE messages as well as MEASUREMENT REPORT message in case of state transition to CELL_FACH without CELL UPDATE. The UE includes the indication in one of these messages at every transition to RRC Connected mode even though the logging period has not ended, upon connection to RAT which configured the UE to perform Logged MDT measurements and RPLMN which is equal to a PLMN in the MDT PLMN list.

The indicator shall be also provided in UEInformationResponse message during MDT report retrieval in case the UE has not transferred the total log in one RRC message in order to indicate the remaining data availability.

The UE will not indicate the availability of MDT measurements in another RAT or in a PLMN that is not in the MDT PLMN list.

The network may decide to retrieve the logged measurements based on this indication. In case Logged MDT measurements are retrieved before the completion of the pre-defined logging duration, the reported measurement results are deleted, but MDT measurement logging will continue according to ongoing logged measurement configuration.

In case the network does not retrieve Logged MDT measurements, UE should store non-retrieved measurements for 48 hours from the moment the duration timer for logging expired. There is no requirement to store non-retrieved data beyond 48 hours. In addition, all logged measurement configuration and the log shall be removed by the UE at switch off or detach.

Reference

TS25.304 clause 5.7, TS 25.331 clauses 8.5.65.2, 8.5.64.3 and TS 37.320 clause 5.1.1.3.1.

8.6.3.2.3          Test Purpose

1.   Verify logging and reporting of Logged MDT GERAN Inter-RAT measurements

8.6.3.2.4          Method of test

Initial Condition

System Simulator: 2 cells – cell 1 and cell 9 are active. Cell 1 is UTRA FDD or TDD cells. Cell 9 is GSM cell. The PLMN of Cell 1 and Cell 9 are the same.

UE: CELL_DCH (state 6-9) in cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

Table 8.6.3.2-1and Table 8.6.3.2-2 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Row marked "T0" denotes the initial conditions after preamble, while columns marked "T1" is to be applied subsequently.

**Table 8.6.3.2-1: Time instances of cell power level and parameter changes**

| Parameter | Unit | Cell 1 (UTRA) | | |
|---|---|---|---|---|
| | | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | |
| CPICH Ec | dBm/3.84MHz | -60 | -80 | -60 |
| PCCPCH_RSCP (TDD) | dBm | -60 | -80 | -60 |

**Table 8.6.3.2-2**

| Parameter | Unit | Cell 9 (GSM) | | |
|---|---|---|---|---|
| | | T0 | T1 | T2 |
| Test Channel | | 1 | | |
| RF Signal Level | dBm | -90 | -48 | -90 |
| RXLEV_ACCESS_MIN | dBm | -100 | -100 | -100 |
| FDD_Qmin | dB | -20 | -20 | -20 |
| FDD_Qoffset | dBm | 0 | 0 | 0 |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode

Wait 10s to allow UE to activate logging.

SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.3.2-1 and table 8.6.3.2-2. The UE shall find that the cell 9 is better and attempt to perform a cell reselection.

UE reselects to GERAN cell 9.

SS applies the downlink transmission power settings, according to the values in columns "T2" of table 8.6.3.2-1 and table 8.6.3.2-2. The UE shall find that the cell 1 is better and attempt to perform a cell reselection.

SS Waits for random access requests from the UE on Cell 1 and transmits a Paging message on Cell 1.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, with IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD". And Logged Measurements of Cell 9 is in the Logged Measurements inter RAT Neighbouring Cells list".

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | | ← | RRC CONNECTION RELEASE | |
| 3 | | → | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 10s to allow UE to activate logging. |
| 5 | - | - | - | SS applies the downlink transmission power settings, according to the values in columns "T1" of table 8.6.3.2-1 and table 8.6.3.2-2. The UE shall find that the cell 9 is better and attempt to perform a cell reselection. |
| 6 | - | - | - | UE reselects to GERAN cell 9. |
| 7 | - | - | - | SS applies the downlink transmission power settings, according to the values in columns "T2" of table 8.6.3.2-1 and table 8.6.3.2-2. The UE shall find that the cell 1 is better and attempt to perform a cell reselection. |
| 8 | | | | Waits for random access requests from the UE on Cell 1. |
| 9 | <-- | | Paging | SS transmits a Paging message on Cell 1. |
| 10 | | → | RRC CONNECTION REQUEST | |
| 11 | | ← | RRC CONNECTION SETUP | |
| 12 | | → | RRC CONNECTION SETUP COMPLETE | |

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 13 | ← | | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 14 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message. And Logged Measurements of Cell 9 is in the Logged Measurements GSM frequency list. |

Specific Message Contents

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.64 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

UE INFORMATION REQUEST (Step 13)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | TRUE |
| Logged ANR Report Request | Not Present |

UE INFORMATION RESPONSE (FDD) (Step 14)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT |

| Information Element | Value/remark |
|---|---|
| | CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurements Inter-RAT Neighbour cells list | |
| - Logged Measurements GSM Neighbouring Cells list | |
| - BSIC | Same as cell 9 |
| - Band indicator | Same as cell 9 |
| - BCCH ARFCN | Same as cell 9 |
| - GSM carrier RSSI | (0...63) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 14)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Inter-RAT Neighbour cells list | |
| - Logged Measurements GSM Neighbouring Cells list | 1 entry |
| - BSIC | Same as cell 9 |
| - Band indicator | Same as cell 9 |
| - BCCH ARFCN | Same as cell 9 |

| Information Element | Value/remark |
|---|---|
| - GSM carrier RSSI | (0...63) |
| - Logged Meas Available | Not checked |

#### 8.6.3.2.5 Test requirement

At step 14, the UE shall transmit a UE INFORMATION RESPONSE message, with IE "Logged Measurements Inter-RAT Neighbour cells list" include Logged Measurements of Cell 9 (TP1).

### 8.6.3.3 Logged MDT / Maintaining logged measurement configuration / UTRAN to E-UTRAN Inter-RAT mobility

#### 8.6.3.3.1 Definition

#### 8.6.3.3.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.3.6.3 (TP1, TP2)]

The UE shall be able to receive a HANDOVER TO UTRAN COMMAND message and perform an inter-RAT handover, even if no prior UE measurements have been performed on the target UTRAN cell and/or frequency.

The UE shall act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following.

The UE may:

1> maintain a list of the set of cells to which the UE has Radio Links if the IE "Cell ID" is present.

The UE shall:

…

1> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

2> include IE "Logged Meas Available".

…

1> and the procedure ends.

[TS 25.331, clause 8.5.63.3 (TP1, TP2)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

1> if IE "Logged Measurements Configuration Info" is present:

2> if stored, discard the existing logged measurement configuration as well as the logged measurement information as specified in 8.5.66;

2> store the received IEs "Logging Duration", "Logging Interval", "Area Configuration" if included in IE "Logged Measurements Configuration Info" in variable LOGGED_MEAS_CONFIG and IEs "Absolute Time Info", "Trace reference", "Trace recording session" and "TCE Id" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOGGED_MEAS_REPORT_VARIABLE;

2> start timer T326 with the timer value set to the IE "Logging Duration".

NOTE: The UE should not stop timer T326 unless explicitly stated when it moves to another RAT.

1> if IE "Logged ANR configuration Info" is present:

2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.68;

2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

2> store the list of Equivalent PLMNs in the IE "Equivalent PLMN Identity List" in variable LOG_ANR_REPORT_VARIABLE;

2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

Reference

TS25.304 clause 5.7, TS 25.331 clauses 8.5.6.3 and 8.5.63.3.

8.6.3.3.3 Test Purpose

1. Verify indication of availability of Logged MDT measurements in HANDOVER TO UTRAN COMMAND message.

2. Verify that logged measurement configurations and logs are maintained despite periods of interruptions due to UE transitions to E-UTRAN.

8.6.3.3.4 Method of test

System Simulator: 1 UTRAN FDD cell (or TDD cell) and 1 E-UTRAN cell. Cell 1 is a UTRAN cell, and Cell 2 is an E-UTRAN Cell. Cell 2 configuration refers to "Cell 1" in TS36.508 clause 6.3.

UE: PS-DCCH+DTCH_DCH (state 6-10) in Cell 1as specified in clause 7.4 of TS 34.108.

Related ICS/IXIT statements

- Compressed mode required yes/no

- UE supports E-UTRAN.

Test Procedure

Table 8.6.3.3 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Column marked "T0" denotes the initial condition. Subsequent configurations marked "T1", "T2" are applied at the points indicated described in the texts in this clause.

| | Parameter | Unit | | |
|---|---|---|---|---|
| T2 | Cell-specific RS EPRE | dBm/15k Hz | - | -90 |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | -65 | - |
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.2 8 MHz | -65 | - |

**Table 8.6.3.3: Time instances of cell power level and parameter changes**

| | Parameter | Unit | Cell 1(UTRA) | Cell 2(E-UTRA) | Remark |
|---|---|---|---|---|---|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | - | -90 | |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | -65 | - | |
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.2 8 MHz | -65 | - | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | - | -70 | The power level values are such that entering conditions for event 3a are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | -100 | - | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.2 8 MHz | -100 | - | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | - | -90 | |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | -65 | - | |
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.2 8 MHz | -65 | - | |

The UE is in CELL_DCH state of cell 1. SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode.

Wait 10s to allow UE to activate logging.

The UE transmits an RRC CONNECTION REQUEST message to SS.

SS transmits an RRC CONNECTION SETUP message to the UE.

The UE transmits an RRC CONNECTION SETUP COMPLETE message to SS, and enters CELL_DCH state.

The UE receive "HANDOVER FROM UTRAN COMMAND" message from cell1, and handover to E-UTRAN cell 2,

The UE handover to UTRAN cell from E-UTRAN cell, and send HANDOVER TO UTRAN COMMAND message.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, with IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |

| Step | Direction | | Message | Comment |
|------|-----------|------|---------|---------|
| | UE | SS | | |
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | | ← | RRC CONNECTION RELEASE | |
| 3 | → | | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 10s to allow UE to activate logging. |
| 5 | → | | RRC CONNECTION REQUEST | By outgoing call operation. |
| 6 | | ← | RRC CONNECTION SETUP | |
| 7 | → | | RRC CONNECTION SETUP COMPLETE | |
| 8 | | ← | PHYSICAL CHANNEL RECONFIGURATION | Compressed mode pattern sequence parameters are loaded to UE. |
| 9 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | |
| 10 | | ← | MEASUREMENT CONTROL | SS configures event 3a in the UE. If the UE requires compressed mode (refer ICS/IXIT), compressed mode is started. |
| 11 | | | | SS re-adjusts the downlink transmission power settings according to columns "T1" in tables 8.6.3.3. |
| 12 | → | | MEASUREMENT REPORT | After about 2s, the UE sends a MEASUREMENT REPORT to SS triggered by event 3a. |
| 13 | | ← | HANDOVER FROM UTRAN COMMAND | The SS transmits a HANDOVER FROM UTRAN COMMAND message to UE. |
| 14 | → | | *RRCConnectionReconfigurationComplete* | The UE shall send a *RRCConnectionReconfigurationComplete* message to cell 2. |
| 15 | | ← | *RRCConnectionReconfiguration* | The SS transmits an *RRCConnectionReconfiguration* message to setup inter RAT measurement on Cell 2. |
| 16 | → | | *RRCConnectionReconfigurationComplete* | The UE transmits an *RRCConnectionReconfigurationComplete* message to confirm the setup of inter RAT measurement on Cell 2. |
| 17 | | | | SS re-adjusts the downlink transmission power settings according to columns "T2" in tables 8.6.3.3. |
| 18 | → | | *MeasurementReport* | The UE transmits a *MeasurementReport message to cell 2.* |
| 19 | | ← | *MobilityFromEUTRACommand* | The SS transmits a *MobilityFromEUTRACommand* message on Cell 2. |
| 20 | → | | HANDOVER TO UTRAN COMPLETE | The UE transmit a HANDOVER TO UTRAN COMPLETE message on cell 1. |
| 21 | | ← | SECURITY MODE COMMAND | The SS transmits a SECURITY MODE COMMAND message on Cell 1 in order to activate integrity protection. |

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 22 | → | | SECURITY MODE COMPLETE | The UE transmits a SECURITY MODE COMPLETE message on Cell 1. |
| 23 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 24 | → | | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, with IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" |

Specific Message Contents

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.65 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

FFS

HANDOVER TO UTRAN COMPLETE (Step 20)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| **UE Information elements** | |
| START list | Not checked |
| - CN domain identity | Not checked |
| - START | Not checked |
| **RB Information elements** | |
| - COUNT-C activation time | Not checked |
| **Other Information elements** | |
| - Logged Meas Available | TRUE |

UE INFORMATION RESPONSE (FDD) (Step 24)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |

| Information Element | Value/remark |
|---|---|
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |
| - CPICH Ec/N0 | (0..49) |
| - Logged Measurements E-UTRA frequency list | 1 entry |
| - E-UTRA Carrier Frequency | Same as cell 2 |
| - Logged Measurements E-UTRA Frequency Neighbours List | 1 entry |
| - Physical Cell Identity | Same as cell 2 |
| - RSRP | (0..97) |
| - RSRQ | (0..34) |
| - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 24)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | TDD |
| - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-TDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |
| - Logged Measurements Inter-RAT Neighbour cells list | |
| - Logged Measurements E-UTRA frequency list | 1 entry |
| - E-UTRA Carrier Frequency | Same as cell 2 |

| Information Element | Value/remark |
|---|---|
| - Logged Measurements E-UTRA Frequency Neighbours List | 1 entry |
| - Physical Cell Identity | Same as cell 2 |
| - RSRP | (0..97) |
| - RSRQ | (0..34) |
| - Logged Meas Available | Not checked |

#### 8.6.3.3.5 Test requirement

At step 20, the UE shall transmit a HANDOVER TO UTRAN COMPLETE message, with the IE "Logged Meas Available" on Cell 1 (TP1).

At step 24, the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 1 and Cell 2 (TP2).

### 8.6.3.4 Logged MDT / Maintaining logged measurement configuration / UTRAN to GERAN Inter-RAT mobility

#### 8.6.3.4.1 Definition

#### 8.6.3.4.2 Conformance requirement

[TS 25.304, clause 5.7 (TP1)]

The UE may be configured to perform logging of measurement results in idle mode, CELL_PCH and URA_PCH state with LOGGING MEASUREMENT CONFIGURATION message specified in TS 25.331 [4]. This configuration is valid while the logging duration timer is running.

If the configuration of logged measurements is valid, the UE shall perform logging of measurement results if all of the following conditions are met:

- the UE is in *camped normally* state in idle mode, CELL_PCH or URA_PCH state;

- RPLMN of the UE is the same as the RPLMN at the point of time of LOGGING MEASUREMENT CONFIGURATION message reception.

- the UE is camped on a cell belonging to Area Configuration (see TS 25.331 [4]), if configured;

- the UE is camped on the RAT where the logged measurement configuration was received.

Otherwise, the logging of measurement results shall be suspended.

NOTE: Even if logging of measurement results is suspended, the logging duration timer and time stamp will continue, and the logged measurement configuration and corresponding log are kept.

[TS 25.331, clause 8.5.65.2 (TP1)]

While T326 is running, the UE shall:

1> perform this logging in accordance with the following:

    2> perform the logging while camping normally on an UTRA cell and the RPLMN of the UE is the same as the PLMN Identity stored in LOGGED_MEAS_REPORT_VARIABLE and, if the IE "Area Configuration" is present in variable LOGGED_MEAS_CONFIG, that is part of the concerned area;

    2> perform the logging at regular intervals, as defined by the IE "Logging Interval" in variable LOGGED_MEAS_CONFIG;

    2> when adding a logged measurement entry in variable LOGGED_MEAS_REPORT_VARIABLE, include the fields in accordance with the following:

        3> set the IE "Relative Time Stamp" to indicate time relative to the moment at which the logged measurement configuration was received;

        3> if GNSS location information became available during the last logging interval:

4> if the UE has been able to calculate a 3-dimensional position:

5> set IE "Ellipsoid point with altitude" to include the location coordinates;

4> else:

5> set IE "Ellipsoid point" to include the location coordinates:

3> set the IE "Cell ID" to indicate cell identity of the cell the UE is camping on obtained from system information;

3> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell that the UE is camping on for UTRA FDD;

3> set the "P-CCPCH RSCP" to include measured quantities for the cell that the UE is camping on for UTRA 1.28 Mcps TDD;

3> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

3> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE:     The UE includes, only once, the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

2> when the memory reserved for the logging of measurements becomes full, stop timer T326 and performs the same actions as performed upon expiry of T326, as specified in 8.5.63.4.

[TS 25.331, clause 8.5.64.3 (TP1)]

UE Shall:

1> if IE "Logged Measurements Report Request" is present:

2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

3> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present:

13> set IE "Logged Meas Report" in the UE INFORMATION RESPONSE as follows:

5> include the IE "Absolute Time Info" and set it to the value of the IE "Absolute Time Info" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "Trace reference" and set it to the value of IE "Trace reference" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "Trace recording session" and set it to the value of IE "Trace recording session" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IE "TCE Id" and set it to the value of IE "TCE Id" in the variable LOGGED_MEAS_REPORT_VARIABLE;

5> include the IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" and set it to include, in the same order as logged, one or more entries from LOGGED_MEAS_REPORT_VARIABLE;

5> clear the logged measurement results included in the list of IEs "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" from LOGGED_MEAS_REPORT_VARIABLE;

5> if the variable LOGGED_MEAS_REPORT_VARIABLE is not empty:

6> include IE "Logged Meas Available";

>> 2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

> 1> if IE "Logged ANR Report Request" is present:

>> 2> if Registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE:

>>> 3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:

>>>> 4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:

>>>>> 5> include the IEs "Logged ANR Report Info List" and set it to include entries from LOG_ANR_REPORT_VARIABLE;

>>>>> 5> clear the logged measurement results included in the list of IEs "Logged ANR Report Info List" from the LOG_ANR_REPORT_VARIABLE;

>>>>> 5> clear the variable LOG_ANR_CONFIG and stop timer T327.

>> 2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 37.320, clause 5.1.1.3.1 (TP2)]

A UE configured to perform Logged MDT measurements indicates the availability of Logged MDT measurements, by means of an indicator, in RRCConnectionSetupComplete message during connection establishment. Furthermore, the indicator (possibly updated) shall be provided within E-UTRAN handover and re-establishment, and UTRAN procedures involving the change of SRNC (SRNC relocation), CELL UPDATE, URA UPDATE messages as well as MEASUREMENT REPORT message in case of state transition to CELL_FACH without CELL UPDATE. The UE includes the indication in one of these messages at every transition to RRC Connected mode even though the logging period has not ended, upon connection to RAT which configured the UE to perform Logged MDT measurements and RPLMN which is equal to a PLMN in the MDT PLMN list.

The indicator shall be also provided in UEInformationResponse message during MDT report retrieval in case the UE has not transferred the total log in one RRC message in order to indicate the remaining data availability.

The UE will not indicate the availability of MDT measurements in another RAT or in a PLMN that is not in the MDT PLMN list.

The network may decide to retrieve the logged measurements based on this indication. In case Logged MDT measurements are retrieved before the completion of the pre-defined logging duration, the reported measurement results are deleted, but MDT measurement logging will continue according to ongoing logged measurement configuration.

In case the network does not retrieve Logged MDT measurements, UE should store non-retrieved measurements for 48 hours from the moment the duration timer for logging expired. There is no requirement to store non-retrieved data beyond 48 hours. In addition, all logged measurement configuration and the log shall be removed by the UE at switch off or detach.

Reference

TS25.304 clause 5.7, TS 25.331 clauses 8.5.65.2, 8.5.64.3 and TS37.320 clause 5.1.1.3.1.

### 8.6.3.4.3 Test Purpose

1. Verify indication of availability of Logged MDT measurements in HANDOVER TO UTRAN COMMAND message.

2. Verify that logged measurement configurations and logs are maintained despite periods of interruptions due to UE transitions to other RAT.

### 8.6.3.4.4 Method of test

Initial Condition

System Simulator: 2 cells – cell 1 and cell 9 are active. Cell 1 is UTRA FDD or TDD cells. Cell 9 is GSM cell. The PLMN of Cell 1 and Cell 9 are the same.

UE: CELL_DCH (state 6-9) in cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.6.3.4-1**

| Parameter | Unit | Cell 1 (UTRA) | | |
|---|---|---|---|---|
| | | T0 | T1 | T2 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | |
| CPICH Ec (FDD) | dBm | -60 | -60 | -60 |
| P-CCPCH RSCP (TDD) | dBm | -60 | -60 | -60 |
| Qrxlevmin | dBm | -101 | -41 | -101 |
| Srxlev* | dBm | 41 | -19 | 41 |

**Table 8.6.3.4-2**

| Parameter | Unit | Cell 9 (GSM) | | |
|---|---|---|---|---|
| | | T0 | T1 | T2 |
| Test Channel | | 1 | | |
| RF Signal Level | dBm | 1 | | |
| RXLEV_ACCESS_MIN | dBm | -80 | | |
| C1* | dBm | -100 | | |
| FDD_Qmin | dB | 20 | | |
| FDD_Qoffset | dBm | -20 | | |

Table 8.6.3.4-1 and table 8.6.3.4-2 illustrate the downlink power to be applied for the 2 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while column marked "T1" and "T2" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

The UE is in CELL_DCH state of cell 1.

SS transmits a LOGGING MEASUREMENT CONFIGURATION message to the UE to configure logged measurements.

SS transmits an RRC CONNECTION RELEASE message to the UE to disconnect the connection.

The UE transmits an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode.

Wait 10s to allow UE to activate logging.

The SS configures its downlink transmission power settings according to columns "T1" in tables' 8.6.3.4-1 and 8.6.3.4-2. The UE performs cell re-selection to Cell 9 and performs location update.

The SS configures its downlink transmission power settings according to columns "T2" in tables' 8.6.3.4-1 and 8.6.3.4-2.

The SS sends a MEASUREMENT INFORMATION to trigger the MS to perform measurements on the UTRAN cell.

The UE sends a MEASUREMENT REPORT to SS.

The SS sends INTERSYSTEM TO UTRAN HANDOVER COMMAND indicating the dedicated channel of the target cell to the MS through the GSM serving cell.

The UE handover to UTRAN cell from GERAN cell, and send HANDOVER TO UTRAN COMMAND message.

SS transmits a UE INFORMATION REQUEST message, and the IE "Logged Measurements Report Request" is present.

The UE shall transmit a UE INFORMATION REPONSE message, with IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD".

Expected Sequence

| Step | Direction | Message | Comment |
|---|---|---|---|

| | UE | SS | | |
|---|---|---|---|---|
| 1 | | ← | LOGGING MEASUREMENT CONFIGURATION | Include IE "Logged Measurements Configuration Info", with "Logging Interval" set as 2.56s and "Logging Duration" set as 10min. |
| 2 | | ← | RRC CONNECTION RELEASE | |
| 3 | | → | RRC CONNECTION RELEASE COMPLETE | The UE sends this message before it completes state transition. |
| 4 | | | | Wait 10s to allow UE to activate logging. |
| 5 | | | | The SS configures its downlink transmission power settings according to columns "T1" in tables' 8.6.3.4-1 and 8.6.3.4-2. The UE performs cell re-selection to Cell 9 and performs location update. |
| 6 | | → | CHANNEL REQUEST | The SS receives this burst on the RACH of cell 9(GSM cell). (triggered by UE location update procedure) |
| 7 | | ← | IMMEDIATE ASSIGNMENT | Sent on AGCH. |
| 8 | SS | | | The SS completes the Location Update procedure requested by the UE. |
| 9 | | | | The SS configures its downlink transmission power settings according to columns "T2" in tables' 8.6.3.4-1 and 8.6.3.4-2. |
| 10 | | ← | MEASUREMENT INFORMATION | |
| 11 | | → | MEASUREMENT REPORT | Including Measurement Results on the UTRAN cell in Step 4 |
| 12 | | ← | INTERSYSTEM TO UTRAN HANDOVER COMMAND | Send on cell 9 (GSM cell) |
| 13 | | → | HANDOVER TO UTRAN COMPLETE | The UE transmit a HANDOVER TO UTRAN COMPLETE message on cell 1. |
| 14 | | ← | SECURITY MODE COMMAND | The SS transmits a SECURITY MODE COMMAND message on Cell 1 in order to activate integrity protection. |
| 15 | | → | SECURITY MODE COMPLETE | The UE transmits a SECURITY MODE COMPLETE message on Cell 1. |
| 16 | | ← | UE INFORMATION REQUEST | SS transmits a UE INFORMATION REQUEST message with IE "Logged Measurements Report Request" set to "true". |
| 17 | | → | UE INFORMATION RESPONSE | The UE shall send a UE INFORMATION RESPONSE message, with IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" |

Specific Message Contents

LOGGING MEASUREMENT CONFIGURATION (Step 1)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged ANR configuration Info | |
| - Absolute Time Info | Set to value corresponding to the absolute time when the message is sent |
| - Logging Duration | 10 min |
| - Logging Interval | 2.66 |
| - Trace reference | |
| - PLMN Identity | Same as MIB |
| - Trace ID | '0EF'H |
| -Trace recording session | '1A'H |
| - TCE Id | '5'H |
| - CHOICE Area Configuration | Not present |

HANDOVER TO UTRAN COMPLETE (Step 13)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| **UE Information elements** | |
| START list | Not checked |
| - CN domain identity | Not checked |
| - START | Not checked |
| **RB Information elements** | |
| - COUNT-C activation time | Not checked |
| **Other Information elements** | |
| - Logged Meas Available | TRUE |

FFS

UE INFORMATION RESPONSE (FDD) (Step 17)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
| - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
| - CHOICE mode | FDD |
| - List of measurements FDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
| - Logged Measurement Info-FDD[x] | |
| - Relative Time Stamp[x] | Not checked |
| - Logged Measurements Serving Cell[x] | |
| - Cell ID[x] | Cell 1 |
| - Primary CCPCH RSCP[x] | (0..91) |

| Information Element | Value/remark |
|---|---|
|    - CPICH Ec/N0 | (0..49) |
|   - Logged Measurements Inter-RAT Neighbour cells list | |
|   - Logged Measurements GSM Neighbouring Cells list | |
|    - BSIC | Same as cell 9 |
|    - Band indicator | Same as cell 9 |
|    - BCCH ARFCN | Same as cell 9 |
|    - GSM carrier RSSI | (0...63) |
|  - Logged Meas Available | Not checked |

UE INFORMATION RESPONSE (TDD) (Step 17)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|  - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|  - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Meas Report | |
|  - Absolute Time Info | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace reference | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - PLMN Identity | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|   - Trace ID | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - Trace recording session | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - TCE Id | Same value as sent by SS in LOGGING MEASUREMENT CONFIGURATION in step 1 |
|  - CHOICE mode | TDD |
|  - List of measurements TDD | At least 1 entry where at least one entry complies to entry with index 'x' below. |
|   - Logged Measurement Info-TDD[x] | |
|   - Relative Time Stamp[x] | Not checked |
|   - Logged Measurements Serving Cell[x] | |
|    - Cell ID | Cell 1 |
|    - Primary CCPCH RSCP | (0..91) |
|  - Logged Measurements Inter-RAT Neighbour cells list | |
|  - Logged Measurements GSM Neighbouring Cells list | 1 entry |
|   - BSIC | Same as cell 9 |
|   - Band indicator | Same as cell 9 |
|   - BCCH ARFCN | Same as cell 9 |
|   - GSM carrier RSSI | (0...63) |
|  - Logged Meas Available | Not checked |

8.6.3.4.5 Test requirement

At step 13, the UE shall transmit a HANDOVER TO UTRAN COMPLETE message, with the IE "Logged Meas Available" on Cell 1 (TP1).

At step 17, the UE shall transmit a UE INFORMATION RESPONSE message includes IE "Logged Meas Report" with logged Measurements of Cell 1 and Cell 9 (TP2).

# 8.6.4 Connection

## 8.6.4.1 Connection Establishment Failure logging / Logging and reporting / T300 expiry

### 8.6.4.1.1 Definition

This test is applicable for all UEs that support Connection Establishment Failure logging services.

### 8.6.4.1.2 Conformance requirement

[TS25.331, clause 8.1.3.5 (TP1,    TP2)]

1> if the UE has not yet received an RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" equal to the value of the variable INITIAL_UE_IDENTITY; and

1> if cell re-selection or expiry of timer T300 or timer T318 occurs:

the UE shall:

1> if the UE performs cell reselection:

  2> clear the variable SYSTEM_INFORMATION_CONTAINER.

1> check the value of V300; and

  2> if V300 is equal to or smaller than N300:

    3> if cell re-selection occurred:

      4> set CFN in relation to SFN of current cell according to subclause 8.5.15.

      4> for FDD and 1.28 Mcps TDD, if the UE supports HS-DSCH reception in CELL_FACH state and if IE: "HS-DSCH common system information" is included in System Information Block type 5 or System Information Block type 5bis:

        5> if variable HS_DSCH_RECEPTION_OF_CCCH_ENABLED is set to TRUE:

          6> reset the MAC-ehs entity [15].

        5> else:

          6> set the variable HS_DSCH_RECEPTION_OF_CCCH_ENABLED to TRUE;

          6> start receiving the HS-DSCH according to the procedure in subclause 8.5.37.

    3> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

    3> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13; and

    3> apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH state and Idle mode);

    3> submit a new RRC CONNECTION REQUEST message to lower layers for transmission on the uplink CCCH;

    3> increment counter V300;

    3> restart timer T300 when the MAC layer indicates success or failure to transmit the message.

  2> if V300 is greater than N300:

    3> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

    3> enter idle mode.

    3> consider the procedure to be unsuccessful;

    3> Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2;

    3> the procedure ends.

[TS25.331, clause 8.1.3.6 (TP1, TP2)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

    1> ignore the rest of the message.

If the values are identical, the UE shall:

...

    1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

    2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

        3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS25.331, clause 8.1.3.11 (TP1,  TP2)]

If the RRC connection establishment fails and the UE supports logging of failed RRC Connection Establishment, the UE shall perform logging of information for later retrieval. The UE shall store connection establishment failure information in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE by setting its fields as follows:

    1> clear the information included in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE, if any;

    1> set the IE "PLMN Identity" to the same value as the selected PLMN [4];

    1> set the IE "Number Of RRC Msg Transmitted" to indicate the number of times the RRC CONNECTION REQUEST message was transmitted by the UE during the failed RRC Connection Establishment procedure.

    1> for TDD:

        2> set the IE "FPACH Received" to TRUE if FPACH was received during the failed RRC Connection Establishment procedure.

        2> if common E-DCH was used, include the IE "E-RUCCH Failure" and set it to TRUE if failure indication of the E-RUCCH transmission was received during the failed RRC Connection Establishment procedure.

    1> if detailed location information is available:

    2> if the UE has been able to calculate a 3-dimensional position:

        3> set the IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

2> else:

    3> set the IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

2> if horizontal velocity information is available:

    3> set the IE "Horizontal velocity" to include the horizontal velocity;

2> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

1> set the IE "PLMN Identity" of the Logged Measurements Failed Cell to indicate the IE "PLMN Identity" obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "Cell ID" to indicate cell identity obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell where the connection establishment failure was detected for UTRA FDD;

1> set the "P-CCPCH RSCP" to include measured quantities for the cell where the connection establishment failure was detected for UTRA 1.28 Mcps TDD;

1> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

1> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

[TS 25.331, clause 8.5.64.3 (TP1, TP2)]

UE Shall:

…

1> if IE "Connection Establishment Failure Request" is present:

    2> if Registered PLMN is the same as the PLMN in the IE "PLMN Identity" stored in variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE:

        3> set IE "Connection Establishment Failure Report" in the UE INFORMATION RESPONSE as follows:

            4> include the IE "Logged Connection Establishment Failure Info-FDD" or "Logged Connection Establishment Failure Info-TDD" and set it to include the entry from the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

            4> set the IE "Time Since Failure" to indicate the elapsed time starting from the Logging of the Connection establishment failure information that is stored in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE.

        3> clear the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

1> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.3.1.5, 8.3.1.6, 8.1.3.11 and 8.5.64.3

.8.6.4.1.3 Test Purpose

1. Verify that Connection Establishment Failure information is logged when T300 is expired and V300 is greater than N300.

2. Verify that IE "Logged Connection Establishment Failure Info Available" is indicated at RRC connection establishment.

3. Verify that Connection Establishment Failure information is reported in connection establishment failure information in UE INFORMATION RESPONSE message.

8.6.4.1.4 Method of test

Initial conditions

System Simulator:

Cell 1

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 3) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test procedure

The UE sends RRC CONNECTION REQUEST message to SS, and SS does not response any message to UE.

The UE resubmits RRC CONNECTION REQUEST message 3 times and does not get any response make V300>N300.

The SS sends Paging message to UE to set up RRC CONNECTION.

The UE transmits an RRC CONNECTION REQUEST message.

When the UE receives RRC CONNECTION SETUP message, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".

The SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report.

The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1.

The SS sends RRC CONNECTION RELEASE message to UE, and makes UE enter idle mode.

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 1 | <-- | | Paging | SS transmits a Paging message. |
| 2 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 3 | - | | - | SS does not send any message to UE. Waits 2 seconds make T300 expire. |
| 4 | - | | - | Repeat steps 2 and 3 2 times, make V300=N300. |
| 5 | - | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 6 | - | | - | SS does not send any message to UE in 5 seconds and allow UE to enter idle mode and perform Connection Establishment Failure logging |
| 7 | <-- | | Paging | SS transmits a Paging message. |
| 8 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 9 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 10 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available". |

| Step | Direction | | Message | Comments |
|------|-----------|---|---------|----------|
| | UE | SS | | |
| 11 | <-- | | UE INFORMATION REQUEST | SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report. |
| 12 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. |
| 13 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode. |
| 14 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

SYSTEM INFORMATION TYPE 1 (Initial conditions and all steps)

| | |
|---|---|
| - UE Timers and constants in idle mode | |
| -T300 | 2000 milliseconds |
| -N300 | 3 |
| -T312 | 10 seconds |
| - N312 | 1 |

RRC CONNECTION SETUP COMPLETE (step 10)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Connection Establishment Failure Info Available | TRUE |

UE INFORMATION REQUEST (Step 11)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | Not Present |
| Logged ANR Report Request | Not Present |
| Connection Establishment Failure Request | TRUE |

UE INFORMATION RESPONSE (FDD) (Step 12)

| Information Element | Value/remark |
|---------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|  - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|  - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
|  - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
|  - CHOICE mode | FDD |
|  - Logged Connection Establishment Failure Info-FDD | |
|   - Number Of RRC Msg Transmitted | 4 |

| Information Element | Value/remark |
|---|---|
| - Logged Measurements Failed Cell | |
|   - Cell ID | Cell 1 |
|   - CPICH RSCP | (0..91) |
|   - CPICH Ec/N0 | (0..49) |

UE INFORMATION RESPONSE (TDD) (Step 12)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|   - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|   - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
|   - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
|   - Logged Connection Establishment Failure Info-FDD | |
|    - Number Of RRC Msg Transmitted | 4 |
|    - FPACH Received | Not checked |
|    - E-RUCCH Failure | Not checked |
|    - Logged Measurements Failed Cell | Logged Measurements Failed Cell |
|     - Cell ID | Cell 1 |
|     - Primary CCPCH RSCP | (0..91) |

### 8.6.4.1.5 Test requirements

At step 10, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".(TP1,TP2).

At step 12, The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. (TP1, TP3).

## 8.6.4.2 Connection Establishment Failure logging / Logging and reporting / Physical channel failure

### 8.6.4.2.1 Definition

This test is applicable for all UEs that support Connection Establishment Failure logging services.

### 8.6.4.2.2 Conformance requirement

[TS 25.331, clause 8.1.3.6 (TP1, TP2)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

    1> ignore the rest of the message.

If the values are identical, the UE shall:

...

    1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS 25.331, clause 8.1.3.7 (TP1, TP2)]

1> If the UE failed to establish, per subclause 8.5.4, the physical channel(s) indicated in the RRC CONNECTION SETUP message; or

1> if the UE performs cell re-selection; or

1> if the UE will be in the CELL_FACH state at the conclusion of this procedure; and

1> if the received RRC CONNECTION SETUP message included the IE "Frequency info" and the UE could not find a suitable UTRA cell on that frequency but it could find a suitable UTRA cell on another frequency; or

1> if the received RRC CONNECTION SETUP message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE; or

1> if the contents of the variable C_RNTI is empty;

1> after having received an RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" equal to the value of the variable INITIAL_UE_IDENTITY; and

1> before the RRC CONNECTION SETUP COMPLETE message is delivered to lower layers for transmission:

the UE shall:

1> clear the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS;

1> clear the variable SYSTEM_INFORMATION_CONTAINER;

1> check the value of V300, and:

2> if V300 is equal to or smaller than N300:

3> set CFN in relation to SFN of current cell according to subclause 8.5.15;

3> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

3> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

3> submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;

3> increment counter V300; and

3> restart timer T300 when the MAC layer indicates success or failure in transmitting the message.

2> if V300 is greater than N300:

3> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

3> enter idle mode;

3> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

3> consider the RRC establishment procedure to be unsuccessful;

3> the procedure ends.

[TS 25.331, clause 8.1.3.11 (TP1, TP2)]

If the RRC connection establishment fails and the UE supports logging of failed RRC Connection Establishment, the UE shall perform logging of information for later retrieval. The UE shall store connection establishment failure information in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE by setting its fields as follows:

1> clear the information included in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE, if any;

1> set the IE "PLMN Identity" to the same value as the selected PLMN [4];

1> set the IE "Number Of RRC Msg Transmitted" to indicate the number of times the RRC CONNECTION REQUEST message was transmitted by the UE during the failed RRC Connection Establishment procedure.

1> for TDD:

2> set the IE "FPACH Received" to TRUE if FPACH was received during the failed RRC Connection Establishment procedure.

2> if common E-DCH was used, include the IE "E-RUCCH Failure" and set it to TRUE if failure indication of the E-RUCCH transmission was received during the failed RRC Connection Establishment procedure.

1> if detailed location information is available:

2> if the UE has been able to calculate a 3-dimensional position:

3> set the IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

2> else:

3> set the IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

2> if horizontal velocity information is available:

3> set the IE "Horizontal velocity" to include the horizontal velocity;

2> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

1> set the IE "PLMN Identity" of the Logged Measurements Failed Cell to indicate the IE "PLMN Identity" obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "Cell ID" to indicate cell identity obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell where the connection establishment failure was detected for UTRA FDD;

1> set the "P-CCPCH RSCP" to include measured quantities for the cell where the connection establishment failure was detected for UTRA 1.28 Mcps TDD;

1> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

1> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE:      The UE includes the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

[TS 25.331, clause 8.5.64.3 (TP1, TP2)]

UE Shall:

…

1> if IE "Connection Establishment Failure Request" is present:

2> if Registered PLMN is the same as the PLMN in the IE "PLMN Identity" stored in variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE:

3> set IE "Connection Establishment Failure Report" in the UE INFORMATION RESPONSE as follows:

4> include the IE "Logged Connection Establishment Failure Info-FDD" or "Logged Connection Establishment Failure Info-TDD" and set it to include the entry from the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

4> set the IE "Time Since Failure" to indicate the elapsed time starting from the Logging of the Connection establishment failure information that is stored in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE.

3> clear the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

1> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.3.1.5, 8.3.1.6, 8.1.3.11 and 8.5.64.3

### .8.6.4.2.3          Test Purpose

1. Verify that Connection Establishment Failure information is logged when Physical channel failure is occurred and V300 is greater than N300.

2. Verify that IE "Logged Connection Establishment Failure Info Available" is indicated at RRC connection establishment.

### 8.6.4.2.4          Method of test

Initial conditions

System Simulator:

Cell 1

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 3) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test procedure

The UE sends RRC CONNECTION REQUEST message to SS, and SS send a RRC CONNECTION SETUP message to UE without physical channel configuration.

Repeat last procedure 3 times make V300>N300.

The SS sends Paging message to UE to set up RRC CONNECTION.

The UE transmits an RRC CONNECTION REQUEST message.

When the UE receives RRC CONNECTION SETUP message, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".

The SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report.

The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1.

The SS sends RRC CONNECTION RELEASE message to UE, and makes UE enter idle mode.

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 1 | <-- | | Paging | SS transmits a Paging message. |
| 2 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 3 | <-- | | RRC CONNECTION SETUP | SS does not configure the physical channel in RRC CONNECTION SETUP message. |
| 4 | - | | - | Repeat steps 2 and 3 3 times, make V300>N300. |
| 5 | - | | - | Waiting 5 seconds allows UE to enter idle mode and perform Connection Establishment Failure logging |
| 6 | <-- | | Paging | SS transmits a Paging message. |
| 7 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 8 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 9 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available". |
| 10 | <-- | | UE INFORMATION REQUEST | SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report. |
| 11 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. |
| 12 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode. |
| 13 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

SYSTEM INFORMATION TYPE 1 (Initial conditions and all steps)

| | |
|---|---|
| - UE Timers and constants in idle mode | |
| -T300 | 2000 milliseconds |
| -N300 | 3 |
| -T312 | 10 seconds |
| - N312 | 1 |

RRC CONNECTION SETUP (Step 3)

| Information Element | Value/remark |
|--------------------|--------------|
| RRC State Indicator | CELL_DCH |
| Uplink DPCH info | Not present |

RRC CONNECTION SETUP COMPLETE (step 9)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Connection Establishment Failure Info Available | TRUE |

UE INFORMATION REQUEST (Step 10)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|    - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|    - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | Not Present |
| Logged ANR Report Request | Not Present |
| Connection Establishment Failure Request | TRUE |

UE INFORMATION RESPONSE (FDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|  - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|  - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
|  - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
|  - CHOICE mode | FDD |
|  - Logged Connection Establishment Failure Info-FDD | |
|   - Number Of RRC Msg Transmitted | 4 |
|   - Logged Measurements Failed Cell | |
|    - Cell ID | Cell 1 |
|    - CPICH RSCP | (0..91) |
|    - CPICH Ec/N0 | (0..49) |

UE INFORMATION RESPONSE (TDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
|  - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
|  - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
|  - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
|  - Logged Connection Establishment Failure Info-FDD | |
|  - Number Of RRC Msg Transmitted | 4 |
|  - FPACH Received | Not checked |
|  - E-RUCCH Failure | Not checked |
|  - Logged Measurements Failed Cell | |
|   - Cell ID | Cell 1 |
|   - Primary CCPCH RSCP | (0..91) |

8.6.4.2.5 Test requirements

At step 9, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".( TP2).

At step 11, The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. (TP1).

### 8.6.4.3 Connection Establishment Failure logging / Logging and reporting / Invalid RRC CONNECTION SETUP message

8.6.4.3.1                  Definition

This test is applicable for all UEs that support Connection Establishment Failure logging services.

8.6.4.3.2                  Conformance requirement

[TS25.331, clause 8.1.3.6 (TP1,    TP2)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

    1> ignore the rest of the message.

If the values are identical, the UE shall:

...

    1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

        2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

           3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS25.331, clause 8.1.3.8(TP1, TP2)]

If the UTRAN instructs the UE to use a configuration, which it does not support e.g., the message includes a pre-defined configuration that the UE has not stored and/or if the received message causes the variable UNSUPPORTED_CONFIGURATION or the variable INVALID_CONFIGURATION to be set to TRUE the UE shall perform procedure specific error handling as specified in this subclause.

If the UE receives an RRC CONNECTION SETUP message which contains an IE "Initial UE identity" with a value which is identical to the value of the variable INITIAL_UE_IDENTITY, but the RRC CONNECTION SETUP message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

    1> stop timer T300 or T318, whichever one is running; and

    1> clear the entry for the RRC CONNECTION SETUP message in the table "Rejected transactions" in the variable TRANSACTIONS and proceed as below.

If the UE receives an RRC CONNECTION SETUP message which contains an IE "Initial UE identity" with a value which is identical to the value of the variable INITIAL_UE_IDENTITY:

    1> if the RRC CONNECTION SETUP message contained a configuration the UE does not support; and/or

1> if the variable UNSUPPORTED_CONFIGURATION becomes set to TRUE due to the received RRC CONNECTION SETUP message; and/or

1> if the variable INVALID_CONFIGURATION becomes set to TRUE due to the received RRC CONNECTION SETUP message:

the UE shall:

1> stop timer T300 or T318, whichever one is running; and

1> clear the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS and proceed as below.

If V300 is equal to or smaller than N300, the UE shall:

1> set the variable PROTOCOL_ERROR_INDICATOR to TRUE;

1> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

1> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13; and

1> apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

1> submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;

1> increment counter V300; and

1> restart timer T300 when the MAC layer indicates success or failure in transmitting the message.

If V300 is greater than N300, the UE shall:

1> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

1> enter idle mode;

1> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

1> consider the RRC establishment procedure to be unsuccessful;

1> the procedure ends.

 [TS25.331, clause 8.1.3.11 (TP1, TP2)]

If the RRC connection establishment fails and the UE supports logging of failed RRC Connection Establishment, the UE shall perform logging of information for later retrieval. The UE shall store connection establishment failure information in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE by setting its fields as follows:

1> clear the information included in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE, if any;

1> set the IE "PLMN Identity" to the same value as the selected PLMN [4];

1> set the IE "Number Of RRC Msg Transmitted" to indicate the number of times the RRC CONNECTION REQUEST message was transmitted by the UE during the failed RRC Connection Establishment procedure.

1> for TDD:

2> set the IE "FPACH Received" to TRUE if FPACH was received during the failed RRC Connection Establishment procedure.

2> if common E-DCH was used, include the IE "E-RUCCH Failure" and set it to TRUE if failure indication of the E-RUCCH transmission was received during the failed RRC Connection Establishment procedure.

1> if detailed location information is available:

2> if the UE has been able to calculate a 3-dimensional position:

   3> set the IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

2> else:

   3> set the IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

2> if horizontal velocity information is available:

   3> set the IE "Horizontal velocity" to include the horizontal velocity;

2> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

1> set the IE "PLMN Identity" of the Logged Measurements Failed Cell to indicate the IE "PLMN Identity" obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "Cell ID" to indicate cell identity obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell where the connection establishment failure was detected for UTRA FDD;

1> set the "P-CCPCH RSCP" to include measured quantities for the cell where the connection establishment failure was detected for UTRA 1.28 Mcps TDD;

1> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

1> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

[TS 25.331, clause 8.5.64.3 (TP1, TP2)]

UE Shall:

…

1> if IE "Connection Establishment Failure Request" is present:

2> if Registered PLMN is the same as the PLMN in the IE "PLMN Identity" stored in variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE:

   3> set IE "Connection Establishment Failure Report" in the UE INFORMATION RESPONSE as follows:

      4> include the IE "Logged Connection Establishment Failure Info-FDD" or "Logged Connection Establishment Failure Info-TDD" and set it to include the entry from the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

      4> set the IE "Time Since Failure" to indicate the elapsed time starting from the Logging of the Connection establishment failure information that is stored in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE.

   3> clear the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

1> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.3.1.5, 8.3.1.8, 8.1.3.11 and 8.5.64.3

### .8.6.4.3.3 Test Purpose

1. Verify that Connection Establishment Failure information is logged when Invalid RRC CONNECTION SETUP message is received and V300 is greater than N300.

2. Verify that IE "Logged Connection Establishment Failure Info Available" is indicated at RRC connection establishment.

### 8.6.4.3.4 Method of test

Initial conditions

System Simulator:

   Cell 1

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 3) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test procedure

The UE sends RRC CONNECTION REQUEST message to SS, and SS send a RRC CONNECTION SETUP message to UE with a unsupported frequency.

Repeats last procedure 3 times make V300>N300.

The SS sends Paging message to UE to set up RRC CONNECTION.

The UE transmits an RRC CONNECTION REQUEST message.

When the UE receives RRC CONNECTION SETUP message, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".

The SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report.

The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1.

The SS sends RRC CONNECTION RELEASE message to UE, and makes UE enter idle mode.

Expected sequence

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 1 | <-- | | Paging | SS transmits a Paging message. |
| 2 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 3 | <-- | | RRC CONNECTION SETUP | SS sends a RRC CONNECTION SETUP message with UE unsupported frequency configuration. |
| 4 | - | - | - | Repeat steps 2 and 3 3 times, make V300>N300. |
| 5 | | - | - | Waiting 5 seconds allows UE to enter idle mode and perform Connection Establishment Failure logging |
| 6 | <-- | | Paging | SS transmits a Paging message. |
| 7 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 8 | <-- | | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 9 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available". |
| 10 | <-- | | UE INFORMATION REQUEST | SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report. |

| Step | Direction | | Message | Comments |
|------|-----------|---|---------|----------|
| | UE | SS | | |
| 11 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. |
| 12 | <-- | | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode. |
| 13 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

SYSTEM INFORMATION TYPE 1 (Initial conditions and all steps)

| | |
|---|---|
| - UE Timers and constants in idle mode | |
| -T300 | 2000 milliseconds |
| -N300 | 3 |
| -T312 | 10 seconds |
| - N312 | 1 |

RRC CONNECTION SETUP (Step 3) (FDD)

| Information Element | Value/remark |
|--------------------|--------------|
| Frequency info | |
| - UARFCN uplink(Nu) | 0 |
| - UARFCN downlink(Nd) | 950 |

RRC CONNECTION SETUP (Step 3) (TDD)

| Information Element | Value/remark |
|--------------------|--------------|
| Frequency info | |
| - UARFCN (Nt) | 0 |

RRC CONNECTION SETUP COMPLETE (step 9)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Connection Establishment Failure Info Available | TRUE |

UE INFORMATION REQUEST (Step 10)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | Not Present |
| Logged ANR Report Request | Not Present |
| Connection Establishment Failure Request | TRUE |

UE INFORMATION RESPONSE (FDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
| - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
| - Logged Connection Establishment Failure Info-FDD | |
| - Number Of RRC Msg Transmitted | 4 |
| - Logged Measurements Failed Cell | |
| - Cell ID | Cell 1 |
| - CPICH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |

UE INFORMATION RESPONSE (TDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
| - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
| - Logged Connection Establishment Failure Info-FDD | |
| - Number Of RRC Msg Transmitted | 4 |
| - FPACH Received | Not checked |
| - E-RUCCH Failure | Not checked |
| - Logged Measurements Failed Cell | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |

### 8.6.4.3.5 Test requirements

At step 9, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".( TP2).

At step 11, The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. (TP1).

## 8.6.4.4 Connection Establishment Failure logging / Logging and reporting / RRC CONNECTION REJECT message

### 8.6.4.4.1 Definition

This test is applicable for all UEs that support Connection Establishment Failure logging services.

### 8.6.4.4.2 Conformance requirement

[TS25.331, clause 8.1.3.6 (TP1, TP2)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

    1> ignore the rest of the message.

If the values are identical, the UE shall:

...

    1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

        2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

           3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS25.331, clause 8.1.3.9(TP1, TP2)]

If the UTRAN instructs the UE to use a configuration, which it does not support e.g., the message includes a pre- When the UE receives an RRC CONNECTION REJECT message on the downlink CCCH, it shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION REJECT message with the value of the variable INITIAL_UE_IDENTITY:

If the values are different, the UE shall ignore the rest of the message;

If the values are identical, the UE shall:

    1> stop timer T300 or T318, whichever one is running; and

    1> clear the entry for the RRC CONNECTION REJECT message in the table "Accepted transactions" in the variable TRANSACTIONS;

    1> if the UE has disabled cell reselection to a UTRA carrier due to an earlier RRC CONNECTION REJECT message, the UE shall resume cell reselection to that UTRA carrier;

    1> if the Rejection Cause is 'unspecified' and the IE "Counting Completion" is present, the UE shall terminate an ongoing MBMS counting procedure according to subclause 8.7.4.4;

    1> if the IE "wait time" <> '0'; and

    1> if the IE "frequency info" is present and:

        2> if V300 is equal to or smaller than N300:

           3> select a suitable UTRA cell according to [4] on that frequency;

           3> after having selected and camped on a suitable cell on the designated UTRA carrier:

               4> set CFN in relation to SFN of current cell according to subclause 8.5.15;

               4> set the contents of the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

    4> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

    4> transmit an RRC CONNECTION REQUEST message on the uplink CCCH;

    4> reset counter V300;

    4> start timer T300 when the MAC layer indicates success or failure in transmitting the message;

    4> disable cell reselection to original UTRA carrier until the time stated in the IE "wait time" has elapsed or until the RRC connection establishment procedure ends, whichever occurs first;

  3> if no suitable cell on the designated UTRA carrier is found:

    4> wait for at least the time stated in the IE "wait time";

    4> set CFN in relation to SFN of current cell according to subclause 8.5.15;

    4> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

    4> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

    4> then submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH of the original serving cell;

    4> increment counter V300;

    4> restart timer T300 when the MAC layer indicates success or failure to transmit the message;

 2> if V300 is greater than N300:

  3> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

  3> enter idle mode;

  3> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

  3> consider the RRC establishment procedure to be unsuccessful;

  3> the procedure ends.

1> if the IE "inter-RAT info" is present:

 2> if the IE "wait time" = '0':

  3> the UE behaviour is not specified.

 2> if V300 is equal to or smaller than N300:

  3> if the IE "GSM target cell info" is present:

    4> attempt to camp on a suitable cell of the list of cells indicated for that RAT;

    4> if the UE selects and camps on one of the cells indicated for that RAT:

      5> disable cell reselection to the original RAT until the time stated in the IE "wait time" has elapsed.

    4> if the UE cannot find any suitable cell from the indicated ones within 10s, the UE is allowed to camp on any suitable cell on that RAT.

      5> after having selected and camped on a suitable cell on the designated RAT:

        6> the UE may disable cell reselection to the original RAT until the time stated in the IE "wait time" has elapsed.

3> if the IE "E-UTRA target info" is present:

4> attempt to camp on a suitable cell on one of the frequencies indicated for that RAT, excluding any cell indicated in the list of not allowed cells for that RAT (i.e. the "blacklisted cells per freq list" for E-UTRA), if present;

4> if the UE selects and camps on one such cell:

5> disable cell reselection to the original RAT until the time stated in the IE "wait time" has elapsed.

4> if the UE cannot find any suitable cell on the indicated frequencies within 10s, the UE is allowed to camp on any suitable cell on that RAT:

5> after having selected and camped on a suitable cell on the designated RAT:

6> disable cell reselection to the original RAT until the time stated in the IE "wait time" has elapsed.

3> if neither the IE "GSM target cell info" nor the IE "E-UTRA target info" is present:

4> select a suitable cell in the designated RAT;

4> after having selected and camped on a suitable cell on the designated RAT:

5> disable cell reselection to the original RAT until the time stated in the IE "wait time" has elapsed or until the UE successfully establishes a connection on the designated RAT, whichever occurs first.

3> if no suitable cell in the designated RAT is found:

4> wait at least the time stated in the IE "wait time";

4> set CFN in relation to SFN of current cell according to subclause 8.5.15;

4> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.

4> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

4> then submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;

4> increment counter V300;

4> restart timer T300 when the MAC layer indicates success or failure to transmit the message;

2> if V300 is greater than N300:

3> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

3> enter idle mode;

3> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

3> consider the RRC establishment procedure to be unsuccessful;

3> the procedure ends.

1> if the IE "wait time" <> '0'; and

1> if neither the IEs "frequency info" nor "inter-RAT info" are present:

2> if V300 is equal to or smaller than N300:

3> wait at least the time stated in the IE "wait time";

    3> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;

    3> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

    3> submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;

    3> increment counter V300;

    3> restart timer T300 when the MAC layer indicates success or failure to transmit the message;

  2> if V300 is greater than N300:

    3> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

    3> enter idle mode;

    3> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

    3> consider the RRC establishment procedure to be unsuccessful;

    3> the procedure ends.

1> if the IE "wait time" = '0':

  2> if the IE "Extended Wait Time" is present and the UE supports "delay tolerant access":

    3> forward the IE "Extended Wait Time" to the upper layers;

  2> enter idle mode;

  2> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

  2> consider the RRC establishment procedure to be unsuccessful;

  2> the procedure ends.

[TS25.331, clause 8.1.3.11 (TP1, TP2)]

If the RRC connection establishment fails and the UE supports logging of failed RRC Connection Establishment, the UE shall perform logging of information for later retrieval. The UE shall store connection establishment failure information in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE by setting its fields as follows:

1> clear the information included in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE, if any;

1> set the IE "PLMN Identity" to the same value as the selected PLMN [4];

1> set the IE "Number Of RRC Msg Transmitted" to indicate the number of times the RRC CONNECTION REQUEST message was transmitted by the UE during the failed RRC Connection Establishment procedure.

1> for TDD:

  2> set the IE "FPACH Received" to TRUE if FPACH was received during the failed RRC Connection Establishment procedure.

  2> if common E-DCH was used, include the IE "E-RUCCH Failure" and set it to TRUE if failure indication of the E-RUCCH transmission was received during the failed RRC Connection Establishment procedure.

1> if detailed location information is available:

  2> if the UE has been able to calculate a 3-dimensional position:

    3> set the IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

  2> else:

    3> set the IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

  2> if horizontal velocity information is available:

    3> set the IE "Horizontal velocity" to include the horizontal velocity;

  2> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

1> set the IE "PLMN Identity" of the Logged Measurements Failed Cell to indicate the IE "PLMN Identity" obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "Cell ID" to indicate cell identity obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell where the connection establishment failure was detected for UTRA FDD;

1> set the "P-CCPCH RSCP" to include measured quantities for the cell where the connection establishment failure was detected for UTRA 1.28 Mcps TDD;

1> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

1> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE: The UE includes the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

[TS 25.331, clause 8.5.64.3 (TP1, TP2)]

UE Shall:

…

1> if IE "Connection Establishment Failure Request" is present:

  2> if Registered PLMN is the same as the PLMN in the IE "PLMN Identity" stored in variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE:

    3> set IE "Connection Establishment Failure Report" in the UE INFORMATION RESPONSE as follows:

      4> include the IE "Logged Connection Establishment Failure Info-FDD" or "Logged Connection Establishment Failure Info-TDD" and set it to include the entry from the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

      4> set the IE "Time Since Failure" to indicate the elapsed time starting from the Logging of the Connection establishment failure information that is stored in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE.

    3> clear the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

1> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.3.1.5, 8.3.1.8, 8.1.3.11 and 8.5.64.3

### .8.6.4.4.3 Test Purpose

1. Verify that Connection Establishment Failure information is logged when RRC CONNECTION REJECT message is received and V300 is greater than N300.

2. Verify that IE "Logged Connection Establishment Failure Info Available" is indicated at RRC connection establishment.

### 8.6.4.4.4 Method of test

Initial conditions

System Simulator:

   Cell 1

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 3) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test procedure

The UE sends RRC CONNECTION REQUEST message to SS, and SS send a RRC CONNECTION REJECT message to UE.

Repeats last procedure 3 times make V300>N300, and waiting 1 seconds before every repeating.

The SS sends Paging message to UE to set up RRC CONNECTION.

The UE transmits an RRC CONNECTION REQUEST message.

When the UE receives RRC CONNECTION SETUP message, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".

The SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report.

The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1.

The SS sends RRC CONNECTION RELEASE message to UE, and makes UE enter idle mode.

Expected sequence

| Step | Direction | | Message | Comments |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | <-- | Paging | SS transmits a Paging message. |
| 2 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 3 | | <-- | RRC CONNECTION REJECT | SS send a RRC CONNECTION REJECT message. |
| 4 | | - | - | Performs the following procedure 3 times make V300>N300: "Waiting 1 second and run step 2 and step 3". |
| 5 | | - | - | Waiting 5 seconds allows UE to enter idle mode and perform Connection Establishment Failure logging |
| 6 | | <-- | Paging | SS transmits a Paging message. |
| 7 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 8 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 9 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available". |
| 10 | | <-- | UE INFORMATION REQUEST | SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report. |

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
| | UE | SS | | |
| 11 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. |
| 12 | | <-- | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode. |
| 13 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

SYSTEM INFORMATION TYPE 1 (Initial conditions and all steps)

| - UE Timers and constants in idle mode | |
|------|------|
| -T300 | 2000 milliseconds |
| -N300 | 3 |
| -T312 | 10 seconds |
| - N312 | 1 |

RRC CONNECTION REJECT (step 3)

| Information Element | Value/remark |
|--------------------|--------------|
| Wait Time | 1 |

RRC CONNECTION SETUP COMPLETE (step 9)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Connection Establishment Failure Info Available | TRUE |

UE INFORMATION REQUEST (Step 10)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Logged Measurements Report Request | Not Present |
| Logged ANR Report Request | Not Present |
| Connection Establishment Failure Request | TRUE |

UE INFORMATION RESPONSE (FDD) (Step 11)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
| - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |

| Information Element | Value/remark |
|---|---|
| - CHOICE mode | FDD |
| - Logged Connection Establishment Failure Info-FDD | |
| - Number Of RRC Msg Transmitted | 4 |
| - Logged Measurements Failed Cell | |
| - Cell ID | Cell 1 |
| - CPICH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |

UE INFORMATION RESPONSE (TDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
| - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
| - Logged Connection Establishment Failure Info-FDD | |
| - Number Of RRC Msg Transmitted | 4 |
| - FPACH Received | Not checked |
| - E-RUCCH Failure | Not checked |
| - Logged Measurements Failed Cell | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |

### 8.6.4.4.5 Test requirements

At step 9, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".( TP2).

At step 11, The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. (TP1).

## 8.6.4.5 Connection Establishment Failure logging / Logging and reporting / Invalid RRC CONNECTION REJECT message

### 8.6.4.5.1 Definition

This test is applicable for all UEs that support Connection Establishment Failure logging services.

### 8.6.4.5.2 Conformance requirement

[TS 25.331, clause 8.1.3.6 (TP1, TP2)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

If the values are different, the UE shall:

    1> ignore the rest of the message.

If the values are identical, the UE shall:

...

    1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

    2> if an IE "Logged Measurement Info-FDD" or "Logged Measurement Info-TDD" in variable LOGGED_MEAS_REPORT_VARIABLE is present and registered PLMN is present in the IE "PLMN Identity List" stored in variable LOGGED_MEAS_REPORT_VARIABLE:

       3> include IE "Logged Meas Available".

...

When the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

...

[TS25.331, clause 8.1.3.10(TP1, TP2)]

If the UE receives an RRC CONNECTION REJECT message which contains an IE "Initial UE identity" with a value which is identical to the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE; but the RRC CONNECTION REJECT message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows:

The UE shall:

    1> stop timer T300 or T318, whichever one is running; and

    1> clear the entry for the RRC CONNECTION REJECT message in the table "Rejected transactions" in the variable TRANSACTIONS;

    1> if V300 is equal to or smaller than N300:

       2> set the variable PROTOCOL_ERROR_INDICATOR to TRUE;

       2> set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

       2> perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH or the common E-DCH (for the Enhanced Uplink in CELL_FACH and Idle mode);

       2> submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;

       2> increment counter V300;

       2> restart timer T300 when the MAC layer indicates success or failure to transmit the message.

    1> if V300 is greater than N300:

       2> if the UE supports logging of failed RRC Connection Establishment, perform the actions specified in subclause 8.1.3.11;

       2> enter idle mode;

       2> perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;

       2> consider the procedure to be successful;

       2> the procedure ends.

[TS25.331, clause 8.1.3.11 (TP1, TP2)]

If the RRC connection establishment fails and the UE supports logging of failed RRC Connection Establishment, the UE shall perform logging of information for later retrieval. The UE shall store connection establishment failure information in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE by setting its fields as follows:

1> clear the information included in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE, if any;

1> set the IE "PLMN Identity" to the same value as the selected PLMN [4];

1> set the IE "Number Of RRC Msg Transmitted" to indicate the number of times the RRC CONNECTION REQUEST message was transmitted by the UE during the failed RRC Connection Establishment procedure.

1> for TDD:

    2> set the IE "FPACH Received" to TRUE if FPACH was received during the failed RRC Connection Establishment procedure.

    2> if common E-DCH was used, include the IE "E-RUCCH Failure" and set it to TRUE if failure indication of the E-RUCCH transmission was received during the failed RRC Connection Establishment procedure.

1> if detailed location information is available:

    2> if the UE has been able to calculate a 3-dimensional position:

        3> set the IE "Ellipsoid point with altitude" or the IE "Ellipsoid point with altitude and uncertainty ellipsoid" to include the location coordinates;

    2> else:

        3> set the IE "Ellipsoid point" or the IE "Ellipsoid point with uncertainty circle" or the IE "Ellipsoid point with uncertainty ellipse" to include the location coordinates:

    2> if horizontal velocity information is available:

        3> set the IE "Horizontal velocity" to include the horizontal velocity;

    2> a value of the IE "Confidence", different from "0" should be calculated, as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid".

1> set the IE "PLMN Identity" of the Logged Measurements Failed Cell to indicate the IE "PLMN Identity" obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "Cell ID" to indicate cell identity obtained from system information of the cell where the connection establishment failure was detected;

1> set the IE "CPICH Ec/N0" and "CPICH RSCP" to include measured quantities of the cell where the connection establishment failure was detected for UTRA FDD;

1> set the "P-CCPCH RSCP" to include measured quantities for the cell where the connection establishment failure was detected for UTRA 1.28 Mcps TDD;

1> set the IE "Logged Measurements Intra Frequency Neighbouring Cells list", "Logged Measurements Inter Frequency list", "Logged Measurements E-UTRA frequency list", "Logged Measurements E-UTRA frequency extension list", in order of decreasing ranking quantity as used for cell re-selection in each frequency for at most the following number of neighbouring cells; 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency per RAT;

1> set the IE "Logged Measurements GSM Neighbouring Cells list" in order of decreasing RXLEV.

NOTE:     The UE includes the latest available results of the measurement performed for cell reselection, which are performed in accordance with the regular performance requirements as specified in [19].

[TS 25.331, clause 8.5.64.3 (TP1, TP2)]

UE Shall:

    …

1> if IE "Connection Establishment Failure Request" is present:

> > 2> if Registered PLMN is the same as the PLMN in the IE "PLMN Identity" stored in variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE:

> > > 3> set IE "Connection Establishment Failure Report" in the UE INFORMATION RESPONSE as follows:

> > > > 4> include the IE "Logged Connection Establishment Failure Info-FDD" or "Logged Connection Establishment Failure Info-TDD" and set it to include the entry from the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

> > > > 4> set the IE "Time Since Failure" to indicate the elapsed time starting from the Logging of the Connection establishment failure information that is stored in the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE.

> > > 3> clear the variable LOGGED_CONNECTION_ESTABLISHMENT_FAILURE;

> 1> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

### Reference

TS 25.304 clause 5.7 and TS 25.331 clause 8.3.1.5, 8.3.1.8, 8.1.3.11 and 8.5.64.3

### .8.6.4.5.3 Test Purpose

1. Verify that Connection Establishment Failure information is logged when Invalid RRC CONNECTION REJECT message is received and V300 is greater than N300.

2. Verify that IE "Logged Connection Establishment Failure Info Available" is indicated at RRC connection establishment.

### 8.6.4.5.4 Method of test

#### Initial conditions

System Simulator:

   Cell 1

User Equipment:

UE: PS-DCCH+DTCH_DCH (state 3) in Cell 1 as specified in clause 7.4 of TS 34.108.

#### Test procedure

The UE sends RRC CONNECTION REQUEST message to SS, and SS send a RRC CONNECTION REJECT message with protocol error to UE.

Repeats last procedure 3 times make V300>N300.

The SS sends Paging message to UE.

The UE transmits an RRC CONNECTION REQUEST message.

When the UE receives RRC CONNECTION SETUP message, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".

The SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report.

The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1.

The SS sends RRC CONNECTION RELEASE message to UE, and makes UE enter idle mode.

#### Expected sequence

| Step | Direction | | Message | Comments |
|------|-----------|-----|---------|----------|
| | UE | SS | | |
| 1 | <-- | | Paging | SS transmits a Paging message. |

| Step | Direction | | Message | Comments |
|------|-----|-----|---------|----------|
|      | UE | SS |         |          |
| 2 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 3 | | <-- | RRC CONNECTION REJECT | SS send a RRC CONNECTION REJECT message with protocol error. |
| 4 | - | - | | Performs step 2 and step 3 3 times make V300>N300. |
| 5 | | - | | Waiting 5 seconds allows UE to enter idle mode and perform Connection Establishment Failure logging |
| 6 | | <-- | Paging | SS transmits a Paging message. |
| 7 | --> | | RRC CONNECTION REQUEST | The UE transmits an RRC CONNECTION REQUEST message. |
| 8 | | <-- | RRC CONNECTION SETUP | SS transmit an RRC CONNECTION SETUP message. |
| 9 | --> | | RRC CONNECTION SETUP COMPLETE | The UE shall transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available". |
| 10 | | <-- | UE INFORMATION REQUEST | SS sends an UE INFORMATION REQUEST message to get Connection Establishment Failure Report. |
| 11 | --> | | UE INFORMATION RESPONSE | The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. |
| 12 | | <-- | RRC CONNECTION RELEASE | SS transmits a RRC CONNECTION RELEASE message to release RRC connection and moves to idle mode. |
| 13 | --> | | RRC CONNECTION RELEASE COMPLETE | UE confirms the connection release and returns to Idle mode |

Specific message contents

All messages have the same content as defined in 34.108 clause 9 with the following exceptions:

SYSTEM INFORMATION TYPE 1 (Initial conditions and all steps)

| | |
|---|---|
| - UE Timers and constants in idle mode | |
| -T300 | 2000 milliseconds |
| -N300 | 3 |
| -T312 | 10 seconds |
| - N312 | 1 |

RRC CONNECTION REJECT (step 3)

| Information Element | Value/remark |
|--------------------|--------------|
| Wait Time | 20 |

RRC CONNECTION SETUP COMPLETE (step 9)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | The value of this IE is checked to see that it matches the value of the same IE transmitted in the downlink RRC CONNECTION SETUP message. |
| Connection Establishment Failure Info Available | TRUE |

UE INFORMATION REQUEST (Step 10)

| Information Element | Value/remark |
|--------------------|--------------|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |

| Information Element | Value/remark |
|---|---|
| Logged Measurements Report Request | Not Present |
| Logged ANR Report Request | Not Present |
| Connection Establishment Failure Request | TRUE |

UE INFORMATION RESPONSE (FDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
| - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
| - Logged Connection Establishment Failure Info-FDD | |
| - Number Of RRC Msg Transmitted | 4 |
| - Logged Measurements Failed Cell | |
| - Cell ID | Cell 1 |
| - CPICH RSCP | (0..91) |
| - CPICH Ec/N0 | (0..49) |

UE INFORMATION RESPONSE (TDD) (Step 11)

| Information Element | Value/remark |
|---|---|
| Message Type | |
| RRC transaction identifier | Arbitrarily selects an integer between 0 and 3 |
| Integrity check info | |
| - message authentication code | SS calculates the value of MAC-I for this message and writes to this IE. The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. |
| - RRC message sequence number | SS provides the value of this IE, from its internal counter. |
| Connection Establishment Failure Report | |
| - Time Since Failure | [0..172800] Indicates the elapsed time in seconds between Logging and reporting of Connection establishment failure info. |
| - CHOICE mode | FDD |
| - Logged Connection Establishment Failure Info-FDD | |
| - Number Of RRC Msg Transmitted | 4 |
| - FPACH Received | Not checked |
| - E-RUCCH Failure | Not checked |
| - Logged Measurements Failed Cell | |
| - Cell ID | Cell 1 |
| - Primary CCPCH RSCP | (0..91) |

8.6.4.5.5        Test requirements

At step 9, the UE should transmit an RRC CONNECTION SETUP COMPLETE message including IE "Connection Establishment Failure Info Available".( TP2).

At step 11, The UE shall send an UE INFORMATION RESPONSE message with Connection Establishment Failure Report on cell 1. (TP1).

# 8.7 Automatic Neighbour Relation (ANR) for UTRAN

## 8.7.1 Intra-UTRAN

### 8.7.1.1 Intra-UTRA / Intra-frequency ANR measurement, logging and reporting in IDLE Mode / RSCP Absolute Threshold

#### 8.7.1.1.1 Definition and applicability

All UEs supporting UTRA FDD or UTRA TDD and UTRAN ANR measurements.

#### 8.7.1.1.2 Conformance requirement

[TS 25.304, clause 5.8.1 (TP3)]

The UE may be configured to perform UTRAN ANR measurement and logging in IDLE mode, CELL_PCH and URA_PCH state with Logging Measurement Configuration message as specified in [4]. If configured, the UE will

- perform measurements and evaluation on the cells which are not included in the neighbour cell list in IDLE mode, CELL_PCH and URA_PCH state.

- log information of the detected cells meeting the logging rules as specified in [4].

[TS 25.304, clause 5.8.2.1 (TP4)]

If configured via the Logging Measurement Configuration message, the UE may perform intra-freq and inter-freq ANR measurements and logging only when:

- in IDLE mode, CELL_PCH and URA_PCH state.

- the UE is camping normally on a UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the intra-freq and inter-freq ANR process, the UE may measure on the frequencies associated with the cells listed in the neighbour cell list and log corresponding information of the detected set cells as specified in TS 25.331 [4].

[TS 25.306, clause 4.15 (TP1)]

Support of UTRAN ANR

Defines whether the UE supports measurement and logging in Idle mode, CELL_PCH and URA_PCH states for Automatic Neighbour Relation (ANR) in UTRAN.

[TS 25.331, clause 7.2.1 (TP4)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 8.1.3.6 (TP5)]

...

   1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

...

   2> if an IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present and the registered PLMN is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE:

      3> include IE "ANR Logging Results Available".

...

[TS 25.331, clause 8.5.63.3 (TP2)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

...

> 1> if IE "Logged ANR configuration Info" is present:

>> 2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.68;

>> 2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

>> 2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

>> 2> store the list of Equivalent PLMNs in the IE "Equivalent PLMN Identity List" in variable LOG_ANR_REPORT_VARIABLE;

>> 2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

...

[TS 25.331, clause 8.5.64.3 (TP6)]

UE Shall:

...

> 1> if IE "Logged ANR Report Request" is present:

>> 2> if Registered PLMN is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE:

>>> 3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:

>>>> 4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:

>>>>> 5> include the IEs "Logged ANR Report Info List" and set it to include entries from LOG_ANR_REPORT_VARIABLE;

>>>>> 5> clear the logged measurement results included in the list of IEs "Logged ANR Report Info List" from the LOG_ANR_REPORT_VARIABLE;

>>>>> 5> clear the variable LOG_ANR_CONFIG and stop timer T327.

>> 2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 25.331, clause 8.5.67 (TP4)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements for ANR has been configured, the UE shall:

> 1> Store the available measurements according to the logged measurements configuration in variable LOG_ANR_CONFIG as specified in subclause 8.5.67.2.

[TS 25.331, clause 8.5.67.2 (TP3, TP4)]

While T327 is running, the UE shall:

> 1> perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:

>> 2> if IE "Intra-UTRA ANR" is included in variable LOG_ANR_CONFIG:

>>> 3> if the UE camps normally on an UTRA cell (serving) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and

>> if the serving cell and UTRA cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE; and

>> if the quality of the UTRA cell, not included in the neighbour cell list, exceeds the quality of the serving cell with more than the value of "Logging Relative Threshold", if this IE is present in the Logging Measurement Configuration message; and

>> if the quality of UTRA cell, not included in the neighbour cell list, is above the value of "Absolute Threshold"; and

>> if both the camping UTRAN cell and UTRA cell, not included in the neighbour cell list, are not CSG cells:

>>> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE as follows:

>>>> set the IEs "Serving PLMN Identity" and "Serving Cell" to indicate cell identity of the cell the UE is camping on;

>>>> try to acquire the corresponding system information of the UTRA cell and set to the variable LOG_ANR_REPORT_VARIABLE as follows:

>>>>> set the IE "Cell Identity" to indicate cell identity of this UTRA cell;

>>>>> set the IE "PLMN Identity" to indicate the Primary PLMN which this UTRA cell belongs to;

>>>>> set the IE "UARFCN" and "Cell parameter ID" for a TDD cell or "Primary Scrambling Code" for a FDD cell.

...

[TS 25.331, clause 8.6.3.12 (TP1)]

If the IE "Capability Update Requirement" is included the UE shall:

> if the IE "UE radio access FDD capability update requirement" has the value TRUE:

>> if the UE supports FDD mode:

>>> store its UTRA FDD capabilities and its UTRA capabilities common to FDD and TDD in the IE "UE radio access capability" and the IE "UE radio access capability extension" in variable UE_CAPABILITY_REQUESTED as specified below:

…

> if the IE "UE radio access 3.84 Mcps TDD capability update requirement" has the value TRUE:

>> if the UE supports 3.84 Mcps TDD mode:

>>> store its UTRAN-specific 3.84 Mcps TDD capabilities and its UTRAN–specific capabilities common to FDD and TDD in the variable UE_CAPABILITY_REQUESTED.

> if the IE "UE radio access 7.68 Mcps TDD capability update requirement" has the value TRUE:

>> if the UE supports 7.68 Mcps TDD mode:

>>> store its UTRAN-specific 7.68 Mcps TDD capabilities and its UTRAN–specific capabilities common to FDD and TDD in the variable UE_CAPABILITY_REQUESTED.

> if the IE "UE radio access 1.28 Mcps TDD capability update requirement" has the value TRUE:

>> if the UE supports 1.28 Mcps TDD mode:

>>> store its UTRAN-specific 1.28 Mcps TDD capabilities and its UTRAN–specific capabilities common to FDD and TDD in the variable UE_CAPABILITY_REQUESTED;

…

Reference

3GPP TS 25.304 clauses 5.8.1, 5.8.2.1; 3GPP TS 25.306 clause 4.15; 3GPP TS 25.331 clauses 7.2.1, 8.1.3.6, 8.5.63.3, 8.5.64.3, 8.5.67, 8.5.67.2, 8.6.3.12

### 8.7.1.1.3 Test purpose

1. Verify that UE signals capability "Support of UTRAN ANR".

2. To verify that the UE correctly reads "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message for Intra-UTRA ANR case when Absolute Threshold for RSCP is configured.

3. To verify that the UE trigger and performs ANR measurements on a cell not included in the neighbour cell list when RSCP is configured as Absolute Threshold and UE measured RSCP of the cell exceeds the Absolute Threshold.

4. To verify that the UE performs Intra-frequency ANR measurement in IDLE mode on a cell not listed in the broadcasted intra-frequency cell info list.

5. To verify that the UE includes IE "ANR Logging Results Available" in RRC CONNECTION SETUP message.

6. To verify UE reporting of ANR logged data for UTRA cell.

### 8.7.1.1.4 Method of test

Initial Condition

System Simulator: 3 FDD or TDD cells – cell 1, cell 2 and cell 3 are active.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

NOTE: Cell 2 is listed as intra-frequency neighbour cell. Cell 3 is not included in the intra-frequency or inter-frequency cell info lists.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.1-1**

| Parameter | Unit | Cell 1 | Cell 2 | Cell 3 |
|---|---|---|---|---|
| UTRA RF Channel Number | | Mid Range Test Frequency | Mid Range Test Frequency | Mid Range Test Frequency |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -70 | -70 |
| PCCPCH_RSCP (TDD) | dBm | -60 | -70 | -70 |
| Note: Cell 2 and Cell 3 power levels are set to make UE measured RSCP to exceed the configured RSCP absolute threshold (-100 dBm). | | | | |

Table 8.7.1.1-1 illustrates the downlink power to be applied for the 3 cells.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 does not list Cell 3 in the intra- or inter-frequency cell info lists.

The SS transmits a UE CAPABILITY ENQUIRY message and checks that UE respond with a UE CAPABILITY INFORMATION message indicating that UE supports UTRAN ANR.

The SS configures UE to perform intra-UTRA ANR measurements triggered by RSCP absolute threshold by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS release the RRC connection and UE enters IDLE mode state. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 3.

The SS page the UE to establish an RRC connection. The SS checks that the UE includes the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an ANR measurement for Cell 3 (not in neighbour cell info list for Cell 1), but not for Cell 2 (in neighbour cell info list for Cell 1).

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | UE CAPABILITY ENQUIRY | |
| 3 | → | | UE CAPABILITY INFORMATION | SS checks that IE "Support of UTRAN ANR" is indicated |
| 4 | ← | | UE CAPABILITY INFORMATION CONFIRM | |
| 5 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 6 | ← | | RRC CONNECTION RELEASE | |
| 7 | → | | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 8 | SS | | | Waiting for T$_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 9 | ← | | PAGING TYPE1 | |
| 10 | → | | RRC CONNECTION REQUEST | |
| 11 | ← | | RRC CONNECTION SETUP | |
| 12 | → | | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is included |
| 13 | ← | | UE INFORMATION REQUEST | |
| 14 | → | | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 3, but not for Cell 2 |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 11

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 2 is listed as intra-frequency neighbour cell and that cell 3 is not listed as intra-frequency neighbour cell for cell 1.

UE CAPABILITY INFORMATION (Step 3)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| UE radio access capability | Check that IE "Support of UTRAN ANR" is present (TRUE). |

LOGGING MEASUREMENT CONFIGURATION (Step 5)

Use the LOGGING MEASUREMENT CONFIGURATION message as defined in [9] (TS 34.108) Clause 9 for condition A1 (RSCP Absolute Threshold = -100dBm).

RRC CONNECTION SETUP COMPLETE (Step 12)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| ANR Logging Results Available | Check that IE is set to TRUE. |

UE INFORMATION REQUEST (Step 13)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 14)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info | | Rel-10 |
|   - Serving PLMN Identity | Checked to see that it is identical to the PLMN identity of Cell 1 | |
|   - Serving Cell | Checked to see that it is identical to the Cell ID of Cell 1 | |
|   - CHOICE *logged cell info* | UTRAN | |
|     - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 3 | |
|     - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 3 | |
|     - UARFCN | Checked to see that it is identical to the UARFCN of Cell 3 | |
|     - Cell parameter ID | This IE is checked to be present | |

### 8.7.1.1.5 Test requirement

At step 3 the UE shall transmit a UE CAPABILITY INFORMATION message with the IE "Support of UTRAN ANR" is set to TRUE (TP1).

At step 12 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "ANR Logging Results Available" (TP5).

At step 14 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurement for Cell 3 and no ANR measurement for Cell 2 (TP2,TP3,TP4,TP6).

## 8.7.1.1a Void

## 8.7.1.2 Intra-UTRA / Intra-frequency ANR measurement, logging and reporting in Cell_PCH / Ec/N0 Absolute Threshold (FDD)

### 8.7.1.2.1 Definition and applicability

All UEs supporting UTRA TDD and UTRAN ANR measurement.

### 8.7.1.2.2 Conformance requirement

[TS 25.304, clause 5.8.1 (TP2)]

The UE may be configured to perform UTRAN ANR measurement and logging in IDLE mode, CELL_PCH and URA_PCH state with Logging Measurement Configuration message as specified in [4]. If configured, the UE will

- perform measurements and evaluation on the cells which are not included in the neighbour cell list in IDLE mode, CELL_PCH and URA_PCH state.

- log information of the detected cells meeting the logging rules as specified in [4].

[TS 25.304, clause 5.8.2.1 (TP3)]

If configured via the Logging Measurement Configuration message, the UE may perform intra-freq and inter-freq ANR measurements and logging only when:

- in IDLE mode, CELL_PCH and URA_PCH state.

- the UE is camping normally on a UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the intra-freq and inter-freq ANR process, the UE may measure on the frequencies associated with the cells listed in the neighbour cell list and log corresponding information of the detected set cells as specified in TS 25.331

[TS 25.331, clause 7.2.1 (TP3)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 7.2.2.1 (TP3)]

In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

> …

> 1> if the UE is "in service area":

>> …

>> 2> perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 8.3.1.3 (TP4)]

In case of cell update procedure the UE shall transmit a CELL UPDATE message.

…

The UE shall set the IEs in the CELL UPDATE message as follows:

> …

> 1> if an IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present and the registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE:

>> 2> include IE "ANR Logging Results Available".

[TS 25.331, clause 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

> …

> 1> if IE "Logged ANR configuration Info" is present:

>> 2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.66;

>> 2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

>> 2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

>> 2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

[TS 25.331, clause 8.5.67 (TP3)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements for ANR has been configured, the UE shall:

> 1> Store the available measurements according to the logged measurements configuration in variable LOG_ANR_CONFIG as specified in subclause 8.5.67.2.

[TS 25.331, clause 8.5.67.2 (TP2,TP3)]

While T327 is running, the UE shall:

> 1> perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:

2> if IE "Intra-UTRA ANR" is included in variable LOG_ANR_CONFIG:

>> 3> if the UE camps normally on an UTRA cell (serving) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and

>> 3> if the serving cell and UTRA cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE; and

>> 3> if the quality of the UTRA cell, not included in the neighbour cell list, exceeds the quality of the serving cell with more than the value of "Logging Relative Threshold", if this IE is present in the Logging Measurement Configuration message; and

>> 3> if the quality of UTRA cell, not included in the neighbour cell list, is above the value of "Absolute Threshold"; and

>> 3> if both the camping UTRAN cell and UTRA cell, not included in the neighbour cell list, are not CSG cells:

>>> 4> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE as follows:

>>>> 5> set the IEs "Serving PLMN Identity" and "Serving Cell" to indicate cell identity of the cell the UE is camping on;

>>>> 5> try to acquire the corresponding system information of the UTRA cell and set to the variable LOG_ANR_REPORT_VARIABLE as follows:

>>>>> 6> set the IE "Cell Identity" to indicate cell identity of this UTRA cell;

>>>>> 6> set the IE "PLMN Identity" to indicate the Primary PLMN which this UTRA cell belongs to;

>>>>> 6> set the IE "UARFCN" and "Cell parameter ID" for a TDD cell or "Primary Scrambling Code" for a FDD cell.

Reference

3GPP TS 25.304 clauses 5.8.1, 5.8.2.1; TS 25.331 clauses 7.2.1, 7.2.2.1, 8.3.1.3, 8.5.63.3, 8.5.67, 8.5.67.2

### 8.7.1.2.3          Test purpose

1. To verify that the UE correctly reads "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message for Intra-UTRA ANR when Absolute Threshold for Ec/N0 is configured.

2. To verify that the UE triggers and performs ANR measurements on a cell not in the intra-/inter-frequency cell in list when Ec/N0 is configured as Absolute Threshold and UE measured Ec/N0 of the cell exceeds the Absolute Threshold

3. To verify that the UE performs Intra-freq ANR measurement in CELL_PCH mode on a cell not listed in the broadcasted intra-frequency cell info list.

4. To verify that the UE includes IE "ANR Logging Results Available" in CELL UPDATE message.

### 8.7.1.2.4          Method of test

Initial Condition

System Simulator: 3 FDD cells – Cell 1, Cell 2 and Cell 3 are active.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

Note:      Cell 2 is listed as intra-frequency neighbour cell. Cell 3 is not included in intra-frequency info list.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.2-1**

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec | dBm/3.84MHz | -60 | -70 | -70 | -60 | -57 | -70 |
| Note: Cell 3 power levels is set to make UE measured Ec/N0 to exceed the configured Ec/N0 absolute threshold (-10 dB) at time T0. | | | | | | | |

Table 8.7.1.2-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 does not list Cell 3 in the intra-frequency cell info list.

The SS configures UE to perform intra-UTRA ANR measurements triggered by Ec/N0 absolute threshold by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to CELL_PCH in cell 1. The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message using AM RLC and enters CELL_PCH state. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 3.

The SS configures its downlink transmission power settings according to columns "T1" in table 8.7.1. 2-1. The UE performs cell re-selection to Cell 2 and transmits a CELL UPDATE message including IE "ANR Logging Results Available" to the SS on the uplink CCCH of Cell 2 and set IE "Cell update cause" to "Cell Reselection".

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an ANR measurement for Cell 3 (not in neighbour cell info list for Cell 1), but not for Cell 2 (Ec/N0 absolute threshold not exceeded and Cell 2 in neighbour cell info list for Cell 1).

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 3 | ← | | PHYSICAL CHANNEL RECONFIGURATION | IE "RRC State Indicator" set to "CELL_PCH" |
| 4 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | UE moves to CELL_PCH state in Cell 1. |
| 5 | SS | | | Waiting for $T_{wait}$ seconds to allow UE to activate ANR logging in CELL_PCH state. |

| 6 | SS | | The SS switches its downlink transmission power settings to columns "T1" in table 8.7.1.2-1. |
|---|---|---|---|
| 7 | → | CELL UPDATE | The UE enters the CELL_FACH state and transmits this message with the IE "ANR Logging Results Available" and set IE "Cell update cause" to value "cell reselection". |
| 8 | ← | CELL UPDATE CONFIRM | |
| 9 | ← | UE INFORMATION REQUEST | |
| 10 | → | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 3, but not for Cell 2 |

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 2 is listed as intra-frequency neighbour cell and that Cell 3 is not listed as intra-frequency neighbour cell.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use same message sub-clause 9.1.1 of TS 34.108 for condition A2 (Ec/N0 Absolute Threshold = -10 dB).

PHYSICAL CHANNEL RECONFIGURATION (Step 3)

Use the same message sub-type titled "Packet to CELL_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

CELL UPDATE (Step 7)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| U-RNTI | |
| - SRNC Identity | Check to see if set to '0000 0000 0001' |
| - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| Cell Update Cause | Check to see if set to 'Cell Re-selection' |
| ANR Logging Results Available | TRUE |

UE INFORMATION REQUEST (Step 9)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 10)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info | | Rel-10 |
| - Serving PLMN Identity | Checked to see that it is identical to the PLMN identity of Cell 1 | |
| - Serving Cell | Checked to see that it is identical to the Cell ID of Cell 1 | |
| - CHOICE *logged cell info* | UTRAN | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 3 | |
| - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 3 | |
| - UARFCN | Checked to see that it is identical to the UARFCN of Cell 3 | |
| - Cell parameter ID | This IE is checked to be present | |

8.7.1.2.5 Test requirement

At step 4, the UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message (TP3).

At step 7, the UE shall transmit a CELL UPDATE message on uplink CCCH with "ANR Logging Results Available" and set IE "Cell update cause" to value "cell reselection" (TP4).

At step 10 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurement for Cell 3 and no ANR measurement for Cell 2 (TP1,TP2,TP3).

## 8.7.1.2a Intra-UTRA / Intra-frequency ANR measurement, logging and reporting in CELL_PCH (TDD)

8.7.1.2a.1 Definition and applicability

All UEs supporting UTRA TDD and UTRAN ANR measurement.

8.7.1.2a.2 Conformance requirement

[TS 25.304, clause 5.8.2.1 (TP1)]

If configured via the Logging Measurement Configuration message, the UE may perform intra-freq and inter-freq ANR measurements and logging only when:

- in IDLE mode, CELL_PCH and URA_PCH state.

- the UE is camping normally on a UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the intra-freq and inter-freq ANR process, the UE may measure on the frequencies associated with the cells listed in the neighbour cell list and log corresponding information of the detected set cells as specified in TS 25.331

[TS 25.331, clause 7.2.1 (TP1)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 7.2.2.1 (TP1)]

In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

 …

 1> if the UE is "in service area":

  …

  2> perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 8.3.1.3 (TP2)]

In case of cell update procedure the UE shall transmit a CELL UPDATE message.

…

The UE shall set the IEs in the CELL UPDATE message as follows:

 …

 1> if an IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present and the registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE:

  2> include IE "ANR Logging Results Available".

[TS 25.331, clause 8.5.67 (TP1)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements for ANR has been configured, the UE shall:

1> Store the available measurements according to the logged measurements configuration in variable LOG_ANR_CONFIG as specified in subclause 8.5.67.2.

[TS 25.331, clause 8.5.67.2 (TP1)]

While T327 is running, the UE shall:

1> perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:

2> if IE "Intra-UTRA ANR" is included in variable LOG_ANR_CONFIG:

3> if the UE camps normally on an UTRA cell (serving) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and

3> if the serving cell and UTRA cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE; and

3> if the quality of the UTRA cell, not included in the neighbour cell list, exceeds the quality of the serving cell with more than the value of "Logging Relative Threshold", if this IE is present in the Logging Measurement Configuration message; and

3> if the quality of UTRA cell, not included in the neighbour cell list, is above the value of "Absolute Threshold"; and

3> if both the camping UTRAN cell and UTRA cell, not included in the neighbour cell list, are not CSG cells:

4> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE as follows:

5> set the IEs "Serving PLMN Identity" and "Serving Cell" to indicate cell identity of the cell the UE is camping on;

5> try to acquire the corresponding system information of the UTRA cell and set to the variable LOG_ANR_REPORT_VARIABLE as follows:

6> set the IE "Cell Identity" to indicate cell identity of this UTRA cell;

6> set the IE "PLMN Identity" to indicate the Primary PLMN which this UTRA cell belongs to;

6> set the IE "UARFCN" and "Cell parameter ID" for a TDD cell or "Primary Scrambling Code" for a FDD cell.

Reference

3GPP TS 25.304 clauses 5.8.2.1; TS 25.331 clauses 7.2.1, 7.2.2.1, 8.5.63.3, 8.5.67, 8.5.67.2

8.7.1.2a.3 Test purpose

1. To verify that the UE performs Intra-freq ANR measurement in CELL_PCH mode on a cell not listed in the broadcasted intra-frequency cell info list.

2. To verify that the UE includes IE "ANR Logging Results Available" in CELL UPDATE message.

8.7.1.2a.4 Method of test

Initial Condition

System Simulator: 3 TDD cells – Cell 1, Cell 2 and Cell 3 are active.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

Note: Cell 2 is listed as intra-frequency neighbour cell. Cell 3 is not included in intra-frequency info list.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.2a-1**

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| PCCPCH_RSCP (TDD) | dBm | -60 | -70 | -70 | -60 | -70 | -70 |
| Note: Cell 2 and Cell 3 power levels at T0 are set to make UE measured RSCP to exceed the configured RSCP absolute threshold (-100 dBm). | | | | | | | |

Table 8.7.1.2a-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 does not list Cell 3 in the intra-frequency cell info list.

The SS configures UE to perform intra-UTRA ANR measurements triggered by RSCP absolute threshold by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS transmits a PHYSICAL CHANNEL RECONFIGURATION message, which invokes the UE to transit from CELL_DCH to CELL_PCH in cell 1. The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message using AM RLC and enters CELL_PCH state. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 3.

The SS configures its downlink transmission power settings according to columns "T1" in table 8.7.1. 2-1. The UE performs cell re-selection to Cell 2 and transmits a CELL UPDATE message including IE "ANR Logging Results Available" to the SS on the uplink CCCH of Cell 2 and set IE "Cell update cause" to "Cell Reselection".

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an ANR measurement for Cell 3 (not in neighbour cell info list for Cell 1), but not for Cell 2 (in neighbour cell info list for Cell 1).

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 3 | ← | | PHYSICAL CHANNEL RECONFIGURATION | IE "RRC State Indicator" set to "CELL_PCH" |
| 4 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | UE moves to CELL_PCH state in Cell 1. |
| 5 | SS | | | Waiting for $T_{wait}$ seconds to allow UE to activate ANR logging in CELL_PCH state. |

| 6 | SS | | The SS switches its downlink transmission power settings to columns "T1" in table 8.7.1.2a-1. |
| 7 | → | CELL UPDATE | The UE enters the CELL_FACH state and transmits this message with the IE "ANR Logging Results Available" and set IE "Cell update cause" to value "cell reselection". |
| 8 | ← | CELL UPDATE CONFIRM | |
| 9 | ← | UE INFORMATION REQUEST | |
| 10 | → | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 3, but not for Cell 2 |

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 2 is listed as intra-frequency neighbour cell and Cell 3 is not listed as intra-frequency neighbour cell.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use same message sub-clause 9.1.1 of TS 34.108 for condition A2 (RSCP Absolute Threshold = -100 dBm).

PHYSICAL CHANNEL RECONFIGURATION (Step 3)

Use the same message sub-type titled "Packet to CELL_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

CELL UPDATE (Step 7)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
| --- | --- |
| U-RNTI | |
| - SRNC Identity | Check to see if set to '0000 0000 0001' |
| - S-RNTI | Check to see if set to '0000 0000 0000 0000 0001' |
| Cell Update Cause | Check to see if set to 'Cell Re-selection' |
| ANR Logging Results Available | TRUE |

UE INFORMATION REQUEST (Step 9)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 10)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
| --- | --- | --- |
| Logged ANR Report Info | | Rel-10 |
| - Serving PLMN Identity | Checked to see that it is identical to the PLMN identity of Cell 1 | |
| - Serving Cell | Checked to see that it is identical to the Cell ID of Cell 1 | |
| - CHOICE *logged cell info* | UTRAN | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 3 | |
| - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 3 | |
| - UARFCN | Checked to see that it is identical to the UARFCN of Cell 3 | |
| - Primary Scrambling Code | This IE is checked to be present | |

8.7.1.2a.5 Test requirement

At step 4, the UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message (TP1).

At step 7, the UE shall transmit a CELL UPDATE message on uplink CCCH with "ANR Logging Results Available" and set IE "Cell update cause" to value "cell reselection" (TP2).

At step 10 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurement for Cell 3 and no ANR measurement for Cell 2 (TP1,TP2).

## 8.7.1.3 Intra-UTRA / Inter-frequency ANR measurement, logging and reporting in URA_PCH / RSCP Relative Threshold

### 8.7.1.3.1 Definition and applicability

All UEs supporting UTRA FDD or UTRA TDD and UTRAN ANR measurement.

### 8.7.1.3.2 Conformance requirement

[TS 25.304, clause 5.8.1 (TP2)]

The UE may be configured to perform UTRAN ANR measurement and logging in IDLE mode, CELL_PCH and URA_PCH state with Logging Measurement Configuration message as specified in [4]. If configured, the UE will

- perform measurements and evaluation on the cells which are not included in the neighbour cell list in IDLE mode, CELL_PCH and URA_PCH state.

- log information of the detected cells meeting the logging rules as specified in [4].

[TS 25.304, clause 5.8.2.1 (TP3)]

If configured via the Logging Measurement Configuration message, the UE may perform intra-freq and inter-freq ANR measurements and logging only when:

- in IDLE mode, CELL_PCH and URA_PCH state.

- the UE is camping normally on a UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the intra-freq and inter-freq ANR process, the UE may measure on the frequencies associated with the cells listed in the neighbour cell list and log corresponding information of the detected set cells as specified in TS 25.331

[TS 25.331, clause 7.2.1 (TP3)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 7.2.2.1 (TP3)]

In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

…

1> if the UE is "in service area":

…

2> perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 8.3.1.3 (TP4)]

In case of URA update procedure the UE shall transmit a URA UPDATE message.

…

The UE shall set the IEs in the URA UPDATE message as follows:

…

    1> if IE "Logged ANR report" in variable LOG_ANR_REPORT_VARIABLE is present and registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ ANR_REPORT_VARIABLE:

        2> include IE "ANR Logging Results Available".

[TS 25.331, clause 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

    …

    1> if IE "Logged ANR configuration Info" is present:

        2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.66;

        2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

        2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

        2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

[TS 25.331, clause 8.5.67 (TP3)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements for ANR has been configured, the UE shall:

    1> Store the available measurements according to the logged measurements configuration in variable LOG_ANR_CONFIG as specified in subclause 8.5.67.2.

[TS 25.331, clause 8.5.67.2 (TP2,TP3)]

While T327 is running, the UE shall:

    1> perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:

        2> if IE "Intra-UTRA ANR" is included in variable LOG_ANR_CONFIG:

            3> if the UE camps normally on an UTRA cell (serving) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and

            3> if the serving cell and UTRA cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE; and

            3> if the quality of the UTRA cell, not included in the neighbour cell list, exceeds the quality of the serving cell with more than the value of "Logging Relative Threshold", if this IE is present in the Logging Measurement Configuration message; and

            3> if the quality of UTRA cell, not included in the neighbour cell list, is above the value of "Absolute Threshold"; and

            3> if both the camping UTRAN cell and UTRA cell, not included in the neighbour cell list, are not CSG cells:

                4> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE as follows:

                    5> set the IEs "Serving PLMN Identity" to indicate the IE "PLMN Identity" included in MIB and "Serving Cell" to indicate cell identity of the cell the UE is camping on;

                    5> try to acquire the corresponding system information of the UTRA cell and set to the variable LOG_ANR_REPORT_VARIABLE as follows:

6> set the IE "Cell Identity" to indicate cell identity of this UTRA cell;

6> set the IE "PLMN Identity" to indicate the IE "PLMN Identity" included in MIB of this UTRA cell;

6> set the IE "UARFCN" and "Cell parameter ID" for a TDD cell or "Primary Scrambling Code" for a FDD cell.

Reference

3GPP TS 25.304 clauses 5.8.1, 5.8.2.1; 3GPP TS 25.331 clauses 7.2.1, 7.2.2.1, 8.3.1.3, 8.5.63.3, 8.5.67, 8.5.67.2.

### 8.7.1.3.3 Test purpose

1. To verify that the UE correctly reads "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message for Intra-UTRA ANR case when Logging Relative Threshold for RSCP is configured.

2. To verify that the UE triggers and performs ANR measurements on a cell not in the intra-/inter-frequency cell info list when RSCP Relative Threshold is configured and UE measured RSCP of the cell exceeds the Absolute and Relative Thresholds.

3. To verify that the UE correctly executes inter-freq ANR measurement in URA_PCH state on a cell not listed in the broadcasted inter-frequency cell info list.

4. To verify that the UE includes IE "ANR Logging Results Available" in URA UPDATE message.

### 8.7.1.3.4 Method of test

Initial Condition

System Simulator: 3 FDD or TDD cells – Cell 1, Cell 4 and Cell 5 are active.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

NOTE: Cell 4 is listed as inter-frequency neighbour cell. Cell 5 is not included in the inter-frequency info list.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.3-1**

| Parameter | Unit | Cell 1 | | Cell 4 | | Cell 5 | |
|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | High Range Test Frequency | | High Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -70 | -70 | -60 | -60 | -60 |
| PCCPCH_RSCP (TDD) | dBm | -60 | -70 | -70 | -60 | -60 | -60 |
| URA ID | | URA-ID 1 | | URA-ID 2 | | URA-ID 1 and 2 | |
| Note: Cell 5 power level is set to make UE measured RSCP to exceed the configured RSCP absolute threshold (-100 dBm) and RSCP relative threshold (-8dB). | | | | | | | |

Table 8.7.1.3-1 illustrates the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message has been transmitted in Cell 1 does not list Cell 5 in the inter-frequency cell info list.

The SS configures UE to perform intra-UTRA inter-frequency ANR measurements triggered by RSCP relative and absolute threshold by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS transmits a PHYSICAL CHANNEL RECONFIGURATION message which invokes the UE to transit from CELL_DCH to URA_PCH in Cell 1. The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message using AM RLC and enters URA_PCH state. The UE is assigned with only one URA identity in Cell 1: URA-ID 1. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 5.

SS configures its downlink transmission power settings according to columns "T1" in table 8.7.1.3-1. The UE shall find Cell 4 to be more suitable than Cell 1, and Cell 4 has a different URA ID from Cell 1. The UE shall transmit a URA UPDATE message including IE "ANR Logging Results Available" for Cell 5 to the SS on the uplink CCCH of Cell 4 and set IE "URA update cause" to "change of URA".

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an ANR measurement for Cell 5 (not in neighbour cell info list for Cell 1), but not for Cell 4 (in neighbour cell info list for Cell 1).

Expected Sequence

| Step | Direction | | Message | Comment |
|------|-----------|-----|---------|---------|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the to perform Intra-frequency ANR measurements. |
| 3 | ← | | PHYSICAL CHANNEL RECONFIGURATION | IE "RRC State Indicator" set to "URA_PCH" |
| 4 | → | | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | UE moves to URA_PCH state in Cell 1. |
| 5 | SS | | | Waiting for $T_{wait}$ seconds to allow UE to activate ANR logging in URA_PCH state. |
| 6 | SS | | | The SS switches its downlink transmission power settings to columns "T1" in table 8.7.1.3-1. |
| 7 | → | | URA UPDATE | The UE transmits this message with the IE "ANR Logging Results Available" and set IE "URA update cause" to value "change of URA". |
| 8 | ← | | URA UPDATE CONFIRM | |
| 9 | ← | | UE INFORMATION REQUEST | |
| 10 | → | | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 5, but not for Cell 4 |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1

Use same message sub-clause 6.1 of TS 34.108, with the exception that Cell 4 is listed as inter-frequency neighbour cell and that Cell 5 is not listed as inter-frequency neighbour cell.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use same message sub-clause 9.1.1 of TS 34.108 for condition A1 (RSCP Absolute Threshold), with the exception of the following IEs:

| Information Element | Value/remark |
|---------------------|--------------|
| **Logged Measurements Configuration Info** | |
| **Logged ANR configuration Info** | |

| | |
|---|---|
| - Intra-UTRA ANR<br> - CHOICE *Absolute Threshold*<br>  - RSCP<br> - Logging Relative *Threshold* | RCSP for ANR<br>Not present (default -100 dBm)<br>-4 (-8dB) |

PHYSICAL CHANNEL RECONFIGURATION (Step 3)

Use the same message sub-type titled "Packet to URA_PCH from CELL_DCH in PS" in TS 34.108 clause 9.

URA UPDATE (Step 7)

The same message found in TS 34.108 clause 9 shall be transmitted by the UE on the uplink CCCH, with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| U-RNTI<br> - SRNC Identity<br> - S-RNTI<br>Cell Update Cause<br>ANR Logging Results Available | <br>Check to see if set to '0000 0000 0001'<br>Check to see if set to '0000 0000 0000 0000 0001'<br>Check to see if set to 'change of URA'<br>TRUE |

UE INFORMATION REQUEST (Step 9)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 10)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info<br> - Serving PLMN Identity<br><br> - Serving Cell<br> - CHOICE *logged cell info*<br>  - PLMN Identity<br><br>  - Cell Identity<br>  - UARFCN<br>  - Cell parameter ID | <br>Checked to see that it is identical to the PLMN identity of Cell 1<br>Checked to see that it is identical to the Cell ID of Cell 1<br>UTRAN<br>Checked to see that it is identical to the PLMN identify of Cell 5<br>Checked to see that it is identical to the Cell ID of Cell 5<br>Checked to see that it is identical to the UARFCN of Cell 5<br>This IE is checked to be present | Rel-10 |

8.7.1.3.5          Test requirement

At step 4, the UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message (TP3).

At step 7, the UE shall transmit a URA UPDATE message on uplink CCCH with "ANR Logging Results Available" and set IE "Cell update cause" to value "change of URA" (TP4).

At step 10 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurement for Cell 5 and no ANR measurement for Cell 4 (TP1,TP2,TP3).

## 8.7.1.3a          Void

## 8.7.1.4          Intra-UTRA / Inter-frequency and Intra-frequency ANR measurement, logging and reporting in IDLE Mode / Ec/N0 Relative Threshold / T327 Expiry / Max Number of ANR Logged Items (FDD)

### 8.7.1.4.1          Definition and applicability

All UEs supporting UTRA FDD and UTRAN ANR measurement.

### 8.7.1.4.2              Conformance requirement

[TS 25.304, 5.8.1 (TP4)]

The UE may be configured to perform UTRAN ANR measurement and logging in IDLE mode, CELL_PCH and URA_PCH state with Logging Measurement Configuration message as specified in [4]. If configured, the UE will

- perform measurements and evaluation on the cells which are not included in the neighbour cell list in IDLE mode, CELL_PCH and URA_PCH state.

- log information of the detected cells meeting the logging rules as specified in [4].

[TS 25.304, clause 5.8.2.1 (TP5)]

If configured via the Logging Measurement Configuration message, the UE may perform intra-freq and inter-freq ANR measurements and logging only when:

- in IDLE mode, CELL_PCH and URA_PCH state.

- the UE is camping normally on a UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the intra-freq and inter-freq ANR process, the UE may measure on the frequencies associated with the cells listed in the neighbour cell list and log corresponding information of the detected set cells as specified in TS 25.331

[TS 25.331, 7.2.1 (TP5)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, 8.5.63.3 (TP1,TP3)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

    …

    1> if IE "Logged ANR configuration Info" is present:

        2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.66;

        2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

        2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

        2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

[TS 25.331, 8.5.63.5 (TP2)]

When timer T327 expires, the UE shall:

    1> stop performing ANR measurement and logging, release the variable LOG_ANR_CONFIG.

NOTE:      The UE should not stop timer T327 upon transition to Idle mode, when it moves to another RAT or a PLMN not included in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE. The UE is allowed to keep the stored logged ANR measurements, i.e. to store LOG_ANR_REPORT_VARIABLE 48 hours after T327 starts.

[TS 25.331, clause 8.5.67 (TP5)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements for ANR has been configured, the UE shall:

    1> Store the available measurements according to the logged measurements configuration in variable LOG_ANR_CONFIG as specified in subclause 8.5.67.2.

[TS 25.331, 8.5.67.2 (TP4,TP5,TP6,TP7)]

While T327 is running, the UE shall:

> 1> perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:

>> 2> if IE "Intra-UTRA ANR" is included in variable LOG_ANR_CONFIG:

>>> 3> if the UE camps normally on an UTRA cell (serving) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and

>>> 3> if the serving cell and UTRA cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE; and

>>> 3> if the quality of the UTRA cell, not included in the neighbour cell list, exceeds the quality of the serving cell with more than the value of "Logging Relative Threshold", if this IE is present in the Logging Measurement Configuration message; and

>>> 3> if the quality of UTRA cell, not included in the neighbour cell list, is above the value of "Absolute Threshold"; and

>>> 3> if both the camping UTRAN cell and UTRA cell, not included in the neighbour cell list, are not CSG cells:

>>>> 4> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE as follows:

>>>>> 5> set the IEs "Serving PLMN Identity" to indicate the IE "PLMN Identity" included in MIB and "Serving Cell" to indicate cell identity of the cell the UE is camping on;

>>>>> 5> try to acquire the corresponding system information of the UTRA cell and set to the variable LOG_ANR_REPORT_VARIABLE as follows:

>>>>>> 6> set the IE "Cell Identity" to indicate cell identity of this UTRA cell;

>>>>>> 6> set the IE "PLMN Identity" to indicate the IE "PLMN Identity" included in MIB of this UTRA cell;

>>>>>> 6> set the IE "UARFCN" and "Cell parameter ID" for a TDD cell or "Primary Scrambling Code" for a FDD cell.

> …

>> 2> when maximum number of entries for the ANR logging is reached, stop timer T327 and perform the same actions as upon expiry of T327, as specified in 8.5.63.5.

[TS 25.331, 10.3.10 (TP6,TP7)]

The following table includes constants that are either used as multi bounds (name starting with "max") or as high or low value in a type specification (name starting with "lo" or "hi"). Constants are specified only for values appearing more than once in the RRC specification. In case a constant is related to one or more other constants, an expression is included in the "value" column instead of the actual value.

| Constant | Explanation | Value | Version |
|---|---|---|---|
| **CN information** | | | |
| maxCNdomains | Maximum number of CN domains | 4 | |
| … | | | |
| **ANR information** | | | REL-10 |
| MaxNumANRLoggedItems | Maximum number of entries in Logged ANR Report info | 4 | REL-10 |

[TS 25.331, 13.1 (TP2)]

| Timer | Start | Stop | At expiry |
|-------|-------|------|-----------|
| ... | | | |
| T327 | Upon receiving LOGGING MEASUREMENT CONFIGURATION including the Logged ANR Configuration Info | When reaching the maximum number of entries in the LOG_ ANR_REPORT_VARIABLE or the ANR logging info is reported to the network. When PLMN selection is triggered by NAS | See subclause 8.5.63.5 |

Reference

3GPP TS 25.304 clauses 5.8.1, 5.8.2.1; TS 25.331 clauses 7.2.1, 8.5.63.3, 8.5.63.5, 8.5.67.2, 10.3.7.42a, 10.3.10, 13.1

### 8.7.1.4.3 Test purpose

1. To verify that the UE correctly reads Logging Duration in "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message.

2. To verify the UE behaviour when T327 expires.

3. To verify that the UE correctly reads "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message for Intra-UTRA ANR case when Logging Relative Threshold for Ec/NO is configured.

4. To verify that the UE trigger and performs ANR measurements on a cell not in the intra-/inter-frequency cell info list when Ec/N0 Relative Threshold is configured and UE measured Ec/N0 of the cell exceeds the Absolute and Relative Thresholds.

5. To verify that the UE performs Inter-frequency ANR measurement in IDLE mode on a cell not listed in the broadcasted intra-frequency cell info list.

6. To verify that the UE is capable to log MaxNumANRLoggedItems.

7. To verify that UE when maximum number for ANR logging is reached stops timer T327 and deactivate ANR logging.

### 8.7.1.4.4 Method of test

Initial Condition

System Simulator: 7 FDD cells – Cell 1, Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7. Cell 1 and Cell 4 are active. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are not active.

Note 1: Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are only activated one at the time. Thus is the SS requirement for simultaneous cells for this test case limited to two cells.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

Note 2: Cell 4 is listed as inter-frequency neighbour cell. Cell 2, Cell 3, Cell 5, Cell 6 and Cell 7 are not included in intra- or inter-frequency cell info lists.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.4-1**

| Parameter | Unit | Cell 1 | Cell 4 | Cell 2, Cell 3, and Cell 7 | Cell 5 and Cell 6 |
|---|---|---|---|---|---|
| UTRA RF Channel Number | | Mid Range Test Frequency | HIgh Range Test Frequency | Mid Range Test Frequency | High Range Test Frequency |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -57 | -57 | -57 |
| Note: Cell 2, Cell 3, Cell 5, Cell 6 and Cell 7 power level is set to make UE measured Ec/N0 to exceed the configured Ec/N0 absolute threshold (-10 dB) and Ec/N0 relative threshold (-4 dB). | | | | | |

Table 8.7.1.4-1 illustrates the downlink power to be applied for the different cells. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are only activated one at a time as described below.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 does not list Cell 2, Cell 3, Cell 5, Cell 6 and Cell 7 in the intra- or inter-frequency cell info lists.

The SS configures UE to perform intra-UTRA ANR measurements triggered by Ec/N0 absolute and relative threshold by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS release the RRC connection and UE enters IDLE mode state. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements. The UE will not perform any ANR measurements of Cell 4 as Cell 4 is listed in the inter-frequency neighbour cell list of Cell 1.

The SS deactivates Cell 4 and reconfigure it as Cell 2. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 2.

The SS deactivates Cell 2 and reconfigure it as Cell 3. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 3.

The SS deactivates Cell 3 and reconfigure it as Cell 5. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 5.

The SS deactivates Cell 5 and reconfigure it as Cell 6. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 6. As maximum number of entries for the ANR logging is reached (4) by logging of Cell 2, Cell 3, Cell 5 and Cell 6 then shall UE stop timer T327 and stop performing ANR measurements and logging, and release the ANR logging configuration.

The SS deactivates Cell 6 and reconfigure it as Cell 7. The SS waits $T_{wait}$ seconds to verify that UE does not perform ANR measurement and logging of Cell 7.

The SS page the UE to establish an RRC connection. The UE respond with a RRC CONNECTION SETUP COMPLETE message.

SS transmits a MEASUREMENT CONTROL message to UE. The UE shall perform periodical traffic volume measurement according to this message and then transmit MEASUREMENT REPORT message back to SS. The SS checks that the UE includes the IE "ANR Logging Results Available" in the MEASUREMENT REPORT message.

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an ANR measurement for Cell 2, Cell 3, Cell 5 and Cell 6, but not for Cell 4 or Cell 7.

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 4 | ← | | RRC CONNECTION RELEASE | |
| 5 | → | | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 6 | SS | | | SS waits Twait seconds to allow UE to activate ANR logging in IDLE mode state. |
| 6a | SS | | | SS deactivates Cell 4 and reconfigure it as Cell 2. SS waits Twait seconds to allow UE to activate ANR logging in IDLE mode state. |
| 7 | SS | | | SS deactivates Cell 2 and reconfigure it as Cell 3. SS waits Twait seconds to allow UE to activate ANR logging in IDLE mode state. |
| 8 | SS | | | SS deactivates Cell 3 and reconfigure it as Cell 5. SS waits Twait seconds to allow UE to activate ANR logging in IDLE mode state. |
| 9 | SS | | | SS deactivates Cell 5 and reconfigure it as Cell 6. SS waits Twait seconds to allow UE to activate ANR logging in IDLE mode state. |
| 10 | SS | | | SS deactivates Cell 6 and reconfigure it as Cell 7. SS waits Twait seconds. |
| 11 | ← | | PAGING TYPE1 | |
| 12 | → | | RRC CONNECTION REQUEST | |
| 13 | ← | | RRC CONNECTION SETUP | |
| 14 | → | | RRC CONNECTION SETUP COMPLETE | |
| 15 | ← | | UE INFORMATION REQUEST | |
| 16 | → | | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 2, Cell 3, Cell 5 and Cell 6, but not for Cell 4 or Cell 7 |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 11

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 4 is listed as intra-frequency neighbour cell for cell 1; and that cell 2, cell 3, cell 5, cell 6 and cell 7 are not listed as intra- or inter-frequency neighbour cells for cell 1.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use the LOGGING MEASUREMENT CONFIGURATION message as defined in [9] (TS 34.108) Clause 9 for condition A2 (Ec/N0 Absolute Threshold), with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| **Logged Measurements Configuration Info** | |
| **Logged ANR configuration Info** | |
| - Intra-UTRA ANR | |
| - CHOICE *Absolute Threshold* | Ec/N0 for ANR |
| - Ec/N0 | Not present (default -10 dB) |
| - Logging Relative *Threshold* | -4 (-4 dB) |

UE INFORMATION REQUEST (Step 15)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 16)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info | | Rel-10 |
| - Serving PLMN Identity | Checked to see that it is identical to the PLMN identity of Cell 1 | |
| - Serving Cell | Checked to see that it is identical to the Cell ID of Cell 1 | |
| - CHOICE *logged cell info* | UTRAN (1) | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 2 | |
| - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 2 | |
| - UARFCN | Checked to see that it is identical to the UARFCN of Cell 2 | |
| - Cell parameter ID | This IE is checked to be present | |
| - CHOICE logged cell info | UTRAN (2) | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 3 | |
| - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 3 | |
| - UARFCN | Checked to see that it is identical to the UARFCN of Cell 3 | |
| - Cell parameter ID | This IE is checked to be present | |
| - CHOICE logged cell info | UTRAN (3) | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 5 | |
| - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 5 | |
| - UARFCN | Checked to see that it is identical to the UARFCN of Cell 5 | |
| - Cell parameter ID | This IE is checked to be present | |
| - CHOICE logged cell info | UTRAN (4) | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 6 | |
| - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 6 | |
| - UARFCN | Checked to see that it is identical to the UARFCN of Cell 6 | |
| - Cell parameter ID | This IE is checked to be present | |

8.7.1.4.5          Test requirement

At step 16 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurements for cell 2, cell 3, cell 5 and cell 6 and no ANR measurements for cell 4 or cell 7 (TP1, TP2,TP3,TP4,TP5,TP6,TP7).

## 8.7.1.4a          Intra-UTRA / Inter-frequency and Intra-frequency ANR measurement, logging and reporting in IDLE Mode / T327 Expiry / Max Number of ANR Logged Items (TDD)

8.7.1.4a.1          Definition and applicability

All UEs supporting UTRA TDD and UTRAN ANR measurement.

8.7.1.4a.2          Conformance requirement

[TS 25.304, clause 5.8.2.1 (TP3)]

If configured via the Logging Measurement Configuration message, the UE may perform intra-freq and inter-freq ANR measurements and logging only when:

-   in IDLE mode, CELL_PCH and URA_PCH state.

-   the UE is camping normally on a UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the intra-freq and inter-freq ANR process, the UE may measure on the frequencies associated with the cells listed in the neighbour cell list and log corresponding information of the detected set cells as specified in TS 25.331

[TS 25.331, 7.2.1 (TP3)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

    …

    1>  if IE "Logged ANR configuration Info" is present:

        2>  if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.66;

        2>  store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

        2>  store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

        2>  start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

[TS 25.331, 8.5.63.5 (TP2)]

When timer T327 expires, the UE shall:

        1>  stop performing ANR measurement and logging, release the variable LOG_ANR_CONFIG.

NOTE:   The UE should not stop timer T327 upon transition to Idle mode, when it moves to another RAT or a PLMN not included in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ ANR_REPORT_VARIABLE. The UE is allowed to keep the stored logged ANR measurements, i.e. to store LOG_ANR_REPORT_VARIABLE 48 hours after T327 starts.

[TS 25.331, clause 8.5.67 (TP3)]

When in idle mode, CELL_PCH or URA_PCH state and Logged Measurements for ANR has been configured, the UE shall:

        1>  Store the available measurements according to the logged measurements configuration in variable LOG_ANR_CONFIG as specified in subclause 8.5.67.2.

[TS 25.331, 8.5.67.2 (TP4,TP5)]

While T327 is running, the UE shall:

    1>  perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:

        2>  if IE "Intra-UTRA ANR" is included in variable LOG_ANR_CONFIG:

            3>  if the UE camps normally on an UTRA cell (serving) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and

3> if the serving cell and UTRA cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE; and

3> if the quality of the UTRA cell, not included in the neighbour cell list, exceeds the quality of the serving cell with more than the value of "Logging Relative Threshold", if this IE is present in the Logging Measurement Configuration message; and

3> if the quality of UTRA cell, not included in the neighbour cell list, is above the value of "Absolute Threshold"; and

3> if both the camping UTRAN cell and UTRA cell, not included in the neighbour cell list, are not CSG cells:

4> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE as follows:

5> set the IEs "Serving PLMN Identity" to indicate the IE "PLMN Identity" included in MIB and "Serving Cell" to indicate cell identity of the cell the UE is camping on;

5> try to acquire the corresponding system information of the UTRA cell and set to the variable LOG_ANR_REPORT_VARIABLE as follows:

6> set the IE "Cell Identity" to indicate cell identity of this UTRA cell;

6> set the IE "PLMN Identity" to indicate the IE "PLMN Identity" included in MIB of this UTRA cell;

6> set the IE "UARFCN" and "Cell parameter ID" for a TDD cell or "Primary Scrambling Code" for a FDD cell.

…

2> when maximum number of entries for the ANR logging is reached, stop timer T327 and perform the same actions as upon expiry of T327, as specified in 8.5.63.5.

[TS 25.331, 10.3.10 (TP4,TP5)]

The following table includes constants that are either used as multi bounds (name starting with "max") or as high or low value in a type specification (name starting with "lo" or "hi"). Constants are specified only for values appearing more than once in the RRC specification. In case a constant is related to one or more other constants, an expression is included in the "value" column instead of the actual value.

| Constant | Explanation | Value | Version |
|---|---|---|---|
| **CN information** | | | |
| maxCNdomains | Maximum number of CN domains | 4 | |
| … | | | |
| **ANR information** | | | REL-10 |
| MaxNumANRLoggedItems | Maximum number of entries in Logged ANR Report info | 4 | REL-10 |

[TS 25.331, 13.1 (TP2)]

| Timer | Start | Stop | At expiry |
|---|---|---|---|
| … | | | |
| T327 | Upon receiving LOGGING MEASUREMENT CONFIGURATION including the Logged ANR Configuration Info | When reaching the maximum number of entries in the LOG_ANR_REPORT_VARIABLE or the ANR logging info is reported to the network. When PLMN selection is triggered by NAS | See subclause 8.5.63.5 |

Reference

3GPP TS 25.304 clauses 5.8.2.1; TS 25.331 clauses 7.2.1, 8.5.63.3, 8.5.63.5, 8.5.67.2, 10.3.7.42a, 10.3.10, 13.1

### 8.7.1.4a.3 Test purpose

1. To verify that the UE correctly reads Logging Duration in "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message.

2. To verify the UE behaviour when T327 expires.

3. To verify that the UE performs Inter-frequency ANR measurement in IDLE mode on a cell not listed in the broadcasted intra-frequency cell info list.

4. To verify that the UE is capable to log MaxNumANRLoggedItems.

5. To verify that UE when maximum number for ANR logging is reached stops timer T327 and deactivate ANR logging.

### 8.7.1.4a.4 Method of test

Initial Condition

System Simulator: 7 TDD cells – Cell 1, Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7. Cell 1 and Cell 4 are active. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are not active.

Note 1:    Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are only activated one at the time. Thus is the SS requirement for simultaneous cells for this test case limited to two cells.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

Note 2:    Cell 4 is listed as inter-frequency neighbour cell. Cell 2, Cell 3, Cell 5, Cell 6 and Cell 7 are not included in intra- or inter-frequency cell info lists.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.4a-1**

| Parameter | Unit | Cell 1 | Cell 4 | Cell 2, Cell 3, and Cell 7 | Cell 5 and Cell 6 |
|---|---|---|---|---|---|
| UTRA RF Channel Number | | Mid Range Test Frequency | HIgh Range Test Frequency | Mid Range Test Frequency | High Range Test Frequency |
| PCCPCH_RSCP (TDD) | dBm | -60 | -70 | -70 | -70 |
| Note:     Cell 2, Cell 3, Cell 5, Cell 6 and Cell 7 power level is set to make UE measured Ec/N0 to exceed the configured RSCP absolute threshold (-100 dBm). | | | | | |

Table 8.7.1.4a-1 illustrates the downlink power to be applied for the different cells. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are only activated one at a time as described below.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 does not list Cell 2, Cell 3, Cell 5, Cell 6 and Cell 7 in the intra- or inter-frequency cell info lists.

The SS configures UE to perform intra-UTRA ANR measurements triggered by RSCP absolute threshold by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS release the RRC connection and UE enters IDLE mode state. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements. The UE will not perform any ANR measurements of Cell 4 as Cell 4 is listed in the inter-frequency neighbour cell list of Cell 1.

The SS deactivates Cell 4 and reconfigure it as Cell 2. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 2.

The SS deactivates Cell 2 and reconfigure it as Cell 3. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 3.

The SS deactivates Cell 3 and reconfigure it as Cell 5. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 5.

The SS deactivates Cell 5 and reconfigure it as Cell 6. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 6. As maximum number of entries for the ANR logging is reached (4) by logging of Cell 2, Cell 3, Cell 5 and Cell 6 then shall UE stop timer T327 and stop performing ANR measurements and logging, and release the ANR logging configuration.

The SS deactivates Cell 6 and reconfigure it as Cell 7. The SS waits $T_{wait}$ seconds to verify that UE does not perform ANR measurement and logging of Cell 7.

The SS page the UE to establish an RRC connection. The UE respond with a RRC CONNECTION SETUP COMPLETE message.

SS transmits a MEASUREMENT CONTROL message to UE. The UE shall perform periodical traffic volume measurement according to this message and then transmit MEASUREMENT REPORT message back to SS. The SS checks that the UE includes the IE "ANR Logging Results Available" in the MEASUREMENT REPORT message.

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an ANR measurement for Cell 2, Cell 3, Cell 5 and Cell 6, but not for Cell 4 or Cell 7.

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|------|-----|-----|---------|---------|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 4 | ← | | RRC CONNECTION RELEASE | |
| 5 | → | | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 6 | SS | | | SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 6a | SS | | | SS deactivates Cell 4 and reconfigure it as Cell 2. SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 7 | SS | | | SS deactivates Cell 2 and reconfigure it as Cell 3. SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 8 | SS | | | SS deactivates Cell 3 and reconfigure it as Cell 5. SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 9 | SS | | | SS deactivates Cell 5 and reconfigure it as Cell 6. SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 10 | SS | | | SS deactivates Cell 6 and reconfigure it as Cell 7. SS waits $T_{wait}$ seconds. |
| 11 | ← | | PAGING TYPE1 | |
| 12 | → | | RRC CONNECTION REQUEST | |
| 13 | ← | | RRC CONNECTION SETUP | |
| 14 | → | | RRC CONNECTION SETUP COMPLETE | |
| 15 | ← | | UE INFORMATION REQUEST | |
| 16 | → | | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 2, Cell 3, Cell 5 and Cell 6, but not for Cell 4 or Cell 7 |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 11

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 4 is listed as intra-frequency neighbour cell for cell 1; and that cell 2, cell 3, cell 5, cell 6 and cell 7 are not listed as intra- or inter-frequency neighbour cells for cell 1.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use the LOGGING MEASUREMENT CONFIGURATION message as defined in [9] (TS 34.108) Clause 9 for condition A1 (RSCP Absolute Threshold = -100dBm).

UE INFORMATION REQUEST (Step 15)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 16)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info<br>  - Serving PLMN Identity | Checked to see that it is identical to the PLMN identity of Cell 1 | Rel-10 |
|   - Serving Cell | Checked to see that it is identical to the Cell ID of Cell 1 | |
|   - CHOICE *logged cell info* | UTRAN (1) | |
|     - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 2 | |
|       - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 2 | |
|       - UARFCN | Checked to see that it is identical to the UARFCN of Cell 2 | |
|       - Primary Scrambling Code | This IE is checked to be present | |
|   - CHOICE logged cell info | UTRAN (2) | |
|     - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 3 | |
|       - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 3 | |
|       - UARFCN | Checked to see that it is identical to the UARFCN of Cell 3 | |
|       - Primary Scrambling Code | This IE is checked to be present | |
|   - CHOICE logged cell info | UTRAN (3) | |
|     - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 5 | |
|     - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 5 | |
|     - UARFCN | Checked to see that it is identical to the UARFCN of Cell 5 | |
|     - Primary Scrambling Code | This IE is checked to be present | |
|   - CHOICE logged cell info | UTRAN (4) | |
|     - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 6 | |
|     - Cell Identity | Checked to see that it is identical to the Cell ID of Cell 6 | |
|     - UARFCN | Checked to see that it is identical to the UARFCN of Cell 6 | |
|     - Primary Scrambling Code | This IE is checked to be present | |

### 8.7.1.4a.5 Test requirement

At step 18 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurements for cell 2, cell 3, cell 5 and cell 6 and no ANR measurements for cell 4 or cell 7 (TP1, TP2, TP3,TP4,TP5).

## 8.7.1.5 Intra-UTRA / Re-configuration of ANR measurements

### 8.7.1.5.1 Definition and applicability

All UEs supporting UTRA FDD or UTRA TDD and UTRAN ANR measurement.

### 8.7.1.5.2 Conformance requirement

[TS 25.331, 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

…

1> if IE "Logged ANR configuration Info" is present:

2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.66;

2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;

    2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;

    2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

[TS 25.331, 8.5.64.3 (TP2)]

UE Shall:

...

  1> if IE "Logged ANR Report Request" is present:

    2> if Registered PLMN is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE:

      3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:

        4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:

          5> include the IEs "Logged ANR Report Info List" and set it to include entries from LOG_ANR_REPORT_VARIABLE;

          5> clear the logged measurement results included in the list of IEs "Logged ANR Report Info List" from the LOG_ANR_REPORT_VARIABLE;

          5> clear the variable LOG_ANR_CONFIG and stop timer T327.

    2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 25.331, clause 8.5.68.2 (TP1)]

The UE initiates the procedure to release the existing logging measurements configuration upon receiving a new Logged ANR Configuration in UTRAN. The UE also shall initiate the procedure after sending UE INFORMATION RESPONSE message as well as upon switch off or detach.

The UE shall:

  1> if stored, discard the existing logged measurement configuration as well as the logged measurement information, i.e. release the UE variables LOG_ANR_CONFIG and LOG_ANR_REPORT_VARIABLE and stop timer T327.

[TS 25.331, 13.1 (TP1,TP2)]

| Timer | Start | Stop | At expiry |
|-------|-------|------|-----------|
| T327 | Upon receiving LOGGING MEASUREMENT CONFIGURATION including the Logged ANR Configuration Info | When reaching the maximum number of entries in the LOG_ ANR_REPORT_VARIABLE or the ANR logging info is reported to the network. When PLMN selection is triggered by NAS | See subclause 8.5.63.5 |

Reference

3GPP TS 25.331 clauses 8.5.63.3, 8.5.64.3, 8.5.68.2, 13.1

### 8.7.1.5.3 Test purpose

1. Verify that UE, upon reception of new LOGGING MEASUREMENT CONFIGURATION message, clears the logged ANR configuration and stored logged measurement results, stops timer T327, stores the new logged ANR configuration and restarts the T327 timer.

2. To verify that the UE clear the logged ANR configuration and stored logged measurements results and stops timer T327 after UE INFORMATION RESPONSE message has been sent to the network.

8.7.1.5.4 Method of test

Initial Condition

System Simulator: 2 FDD or TDD cells – Cell 1 and Cell 2 are active.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents.

Note: Cell 2 is not included in intra- or inter-frequency info list.

SS sets the test parameter $T_{wait}$ to the value of PIXIT 'Px_AnrForUtranMeasLogWaitTime'.

UE: CELL_DCH (state 6-9) in Cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.1.5-1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T0 | T1 | T0 | T1 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | Mid Range Test Frequency | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -60 | -80 | -60 |
| PCCPCH_RSCP (TDD) | dBm | -60 | -60 | -80 | -60 |

Table 8.7.1.5-1 illustrates the downlink power to be applied for the 2 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while column marked "T1" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 does not list Cell 2 in the intra- or inter-frequency cell info lists.

The SS configures UE to perform intra-UTRA ANR measurements triggered by RSCP absolute threshold (-100 dBm) by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS release the RRC connection and UE enters IDLE mode state. The SS waits $T_{wait}$ seconds to allow UE to perform logging of ANR measurements of Cell 2. See note 1.

The SS page the UE to establish an RRC connection. The SS checks that the UE includes the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

The SS reconfigures UE to perform intra-UTRA ANR measurements for a different RSCP absolute threshold (-70dBm) by sending a second LOGGING MEASUREMENT CONFIGURATION message to the UE. The new RSCP absolute threshold is not satisfied by the current power settings of Cell 2.

The SS release the RRC connection and UE enters IDLE mode state. The SS waits $T_{wait}$ seconds to verify that UE does not perform logging of ANR measurements of Cell 2. See note 2.

The SS page the UE to establish an RRC connection. The SS checks that the UE does not include the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

The SS release the RRC connection and UE enters IDLE mode state.

SS configures its downlink transmission power settings according to columns "T1" in table 8.7.1.5-1 to satisfy the reconfigured RSCP absolute threshold.

The SS waits $T_{wait}$ seconds to verify that UE performs logging of ANR measurements of Cell 2. See note 3.

The SS page the UE to establish an RRC connection. The SS checks that the UE includes the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an Intra-UTRA ANR measurement for Cell 2. The UE clear the logged ANR configuration and stored logged measurement results.

The SS release the RRC connection and UE enters IDLE mode state. The SS waits $T_{wait}$ seconds to verify that UE does not perform logging of ANR measurements of Cell 2.

The SS page the UE to establish an RRC connection. The SS checks that the UE does not include the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

Note 1: CPICH Ec of Cell 3 is -80dBm/3.84 MHz, which exceeds the configured Absolute Threshold for RSCP of -100 dBm triggering the ANR logging of Cell 2.

Note 2: CPICH Ec of Cell 3 is -80dBm/3.84 MHz, which is less than the re-configured Absolute Threshold for RSCP of -70dBm. The UE shall not trigger any ANR logging of Cell 2.

Note 3: CPICH Ec of Cell 3 is -60dBm/3.84 MHz, which exceeds the configured Absolute Threshold for RSCP of -70 dBm triggering the ANR logging of Cell 2.

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|------|-----------|------|---------|---------|
| | **UE** | **SS** | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 4 | ← | | RRC CONNECTION RELEASE | |
| 5 | → | | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 6 | SS | | | SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |

| 7 | ← | PAGING TYPE1 | |
|---|---|---|---|
| 8 | → | RRC CONNECTION REQUEST | |
| 9 | ← | RRC CONNECTION SETUP | |
| 10 | → | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is included |
| 11 | ← | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Intra-frequency ANR measurements. |
| 12 | ← | RRC CONNECTION RELEASE | |
| 13 | → | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 14 | SS | | SS waits $T_{wait}$ seconds to verify that UE does not perform ANR measurement and logging of Cell 2. |
| 15 | → | RRC CONNECTION REQUEST | |
| 16 | ← | RRC CONNECTION SETUP | |
| 17 | → | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is not included |
| 18 | ← | RRC CONNECTION RELEASE | |
| 19 | → | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 20 | | | The SS switches its downlink transmission power settings to columns "T1" in table 8.7.1.5-1. |
| 21 | SS | | SS waits $T_{wait}$ seconds to allow UE to activate ANR logging in IDLE mode state. |
| 22 | → | RRC CONNECTION REQUEST | |
| 23 | ← | RRC CONNECTION SETUP | |
| 24 | → | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is included |
| 25 | ← | UE INFORMATION REQUEST | |
| 26 | → | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes an ANR measurement for Cell 2 |
| 27 | ← | RRC CONNECTION RELEASE | |
| 28 | → | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 29 | SS | | SS waits $T_{wait}$ seconds to verify that UE does not perform ANR measurement and logging of Cell 2. |
| 30 | → | RRC CONNECTION REQUEST | |
| 31 | ← | RRC CONNECTION SETUP | |
| 32 | → | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is not included |

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 11 for Cell 1

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 2 is not listed as intra- or inter-frequency neighbour cell.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use the LOGGING MEASUREMENT CONFIGURATION message as defined in [9] (TS 34.108) Clause 9 for condition A1 (RSCP Absolute Threshold = -100dBm).

RRC CONNECTION SETUP COMPLETE (Step 5)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| ANR Logging Results Available | Check that IE is set to TRUE. |

LOGGING MEASUREMENT CONFIGURATION (Step 11)

Use same message sub-clause 9.1.1 of TS 34.108 for condition A1 (RSCP Absolute Threshold), with the exception of the following IEs:

| Information Element | Value/remark |
|---|---|
| **Logged Measurements Configuration Info** **Logged ANR configuration Info** - Intra-UTRA ANR - CHOICE *Absolute Threshold* - RSCP - Logging Relative *Threshold* … | RCSP for ANR -70dBm Not present |

RRC CONNECTION SETUP COMPLETE (Step 17)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| ANR Logging Results Available | Check that IE is absent |

RRC CONNECTION SETUP COMPLETE (Step 24)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| ANR Logging Results Available | Check that IE is set to TRUE. |

UE INFORMATION REQUEST (Step 25)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 26)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info - Serving PLMN Identity - Serving Cell - CHOICE *logged cell info* - PLMN Identity - Cell Identity - UARFCN - Cell parameter ID | Checked to see that it is identical to the PLMN identity of Cell 1 Checked to see that it is identical to the Cell ID of Cell 1 UTRAN Checked to see that it is identical to the PLMN identify of Cell 2 Checked to see that it is identical to the Cell ID of Cell 2 Checked to see that it is identical to the UARFCN of Cell 2 This IE is checked to be present | Rel-10 |

RRC CONNECTION SETUP COMPLETE (Step 32)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| ANR Logging Results Available | Check that IE is absent |

### 8.7.1.5.5 Test requirement

At step 10 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "ANR Logging Results Available" (TP1).

At step 17 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH not including the IE "ANR Logging Results Available" (TP1).

At step 24 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "ANR Logging Results Available" (TP1).

At step 26 the UE shall transmit a UE INFORMATION RESPONSE message including an ANR measurements for cell 2 (TP1,TP2).

At step 32 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "ANR Logging Results Available" (TP2).

## 8.7.1.5a Void

# 8.7.2 Inter-RAT

## 8.7.2.1 Inter-RAT/ANR measurement, logging and reporting / GERAN cell

### 8.7.2.1.1 Definition and applicability

All UEs supporting UTRA FDD or UTRA TDD, GERAN and UTRAN ANR measurements.

### 8.7.2.1.2 Conformance requirement

[TS 25.304, 5.8.2.2 (TP2)]

If configured to perform inter-RAT ANR via the Logging Measurement Configuration message, the UE may perform inter-RAT ANR logging only when:

- after inter-RAT cell reselection from E-UTRAN or GSM to a normal UTRAN cell belonging to the PLMN or the list of Equivalent PLMNs where the Logging Measurement Configuration is received.

During the inter-RAT ANR process, the UE may log the corresponding information of the previously camped E-UTRAN or GSM cell as specified in TS 25.331.

[TS 25.331, clause 7.2.1 (TP2)]

The UE shall perform ANR measurements and logging as specified in [4], when logged ANR measurement is configured.

[TS 25.331, clause 8.1.3.6 (TP3)]

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL_UE_IDENTITY.

…

If the values are identical, the UE shall:

…

  1> submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:

    2> if an IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present and the registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE:

    3> include IE "ANR Logging Results Available".

[TS 25.331, 8.5.63.3 (TP1)]

Upon receiving the LOGGING MEASUREMENT CONFIGURATION message the UE shall:

...

> 1> if IE "Logged ANR configuration Info" is present:
>
>> 2> if variable LOG_ANR_CONFIG was already stored, discard the existing logged measurement configuration for ANR purpose as well as the associated logged measurement information as specified in 8.5.68;
>>
>> 2> store the received IEs in the IE "Logged ANR configuration Info" in variable LOG_ANR_CONFIG;
>>
>> 2> store the current Registered PLMN in the IE "PLMN Identity" in variable LOG_ANR_REPORT_VARIABLE;
>>
>> 2> store the list of Equivalent PLMNs in the IE "Equivalent PLMN Identity List" in variable LOG_ANR_REPORT_VARIABLE;
>>
>> 2> start timer T327 with the timer value set to the IE "Logging Duration" included in IE "Logged ANR configuration Info".

...

[TS 25.331, 8.5.64.3 (TP4)]

UE Shall:

...

> 1> if IE "Logged ANR Report Request" is present:
>
>> 2> if Registered PLMN is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE:
>>
>>> 3> if IE "Logged ANR Report Info" in variable LOG_ANR_REPORT_VARIABLE is present:
>>>
>>>> 4> set IEs "Logged ANR Report Info" in the UE INFORMATION RESPONSE as follows:
>>>>
>>>>> 5> include the IEs "Logged ANR Report Info List" and set it to include entries from LOG_ANR_REPORT_VARIABLE;
>>>>>
>>>>> 5> clear the logged measurement results included in the list of IEs "Logged ANR Report Info List" from the LOG_ANR_REPORT_VARIABLE;
>>>>>
>>>>> 5> clear the variable LOG_ANR_CONFIG and stop timer T327.
>>
>> 2> transmit a UE INFORMATION RESPONSE message on the uplink DCCH using AM RLC.

[TS 25.331, 8.5.67.2 (TP2,TP4)]

While T327 is running, the UE shall:

> 1> perform the ANR measurements and evaluation on UTRAN, E-UTRAN or GERAN cells in accordance with the following:…
>
>> ...
>
>> 2> if IE "Inter-RAT ANR for GSM Indicator" is included in variable LOG_ANR_CONFIG:
>>
>>> 3> if the UE reselected from a GSM cell to an UTRA cell (serving cell) that is part of the PLMN which is the same as one of the PLMNs in the IE "PLMN Identity" or IE "Equivalent PLMN Identity List" stored in variable LOG_ANR_REPORT_VARIABLE; and
>>>
>>> 3> if the previously camped GSM cell is not included in the neighbour cell list in SIB11/11bis/12 of the serving cell; and
>>>
>>> 3> if the serving cell is not a CSG cell; and

3> if the serving cell and GSM cell, not included in the neighbour cell list, together have not earlier been stored by UE in an entry of "Logged ANR Report Info" in the LOG_ANR_REPORT_VARIABLE:

4> log the ANR informaton into the variable LOG_ANR_REPORT_VARIABLE, as follows:

5> set the IEs "Serving PLMN Identity" to indicate the IE "PLMN Identity" included in MIB and "Serving Cell" to indicate cell identity of the serving cell;

5> set the IE "PLMN Identity", "Cell Identity" and "LAC" to indicate global cell identity of this previously camped GSM set cell;

5> set the IE "BSIC", "BCCH ARFCN" and "Band Indicator" of this previously camped GSM set cell.

Reference

3GPP TS 25.304 clauses 5.8.2.2; 3GPP TS 25.331 clauses 7.2.1, 8.1.3.6, 8.5.63.3, 8.5.64.3, 8.5.67.2

### 8.7.2.1.3 Test purpose

1. To verify that the UE correctly reads "Logged ANR configuration Info" in LOGGING MEASUREMENT CONFIGURATION message for Inter-RAT ANR case when GSM Indicator is configured.

2. To verify that the UE performs Inter-RAT ANR measurement for GERAN cells not included in the inter-RAT neighbour cell list of the serving cell.

3. To verify that the UE includes IE "ANR Logging Results Available" in RRC CONNECTION SETUP message after returning from GERAN cell and UE has logged Inter-RAT ANR measurement for GERAN cell.

4. To verify that the UE reports ANR logged data for GSM cell.

### 8.7.2.1.4 Method of test

Initial Condition

System Simulator: 3 cells belonging to different location areas – cell 1, cell 2 and cell 9 are active. Cell 1 and 2 are UTRA FDD or TDD cells. Cell 9 is GSM cells. GPRS. 51.010 clauses 20.22 and 40.1.1 shall be referenced for the default parameters of cell 9. The PLMN of Cell 1 and Cell 2 are the same.

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 1: See specific message contents (cell 9 is listed as inter-RAT neighbour cell).

SYSTEM INFORMATION BLOCK TYPE 11 of Cell 2: See specific message contents (cell 9 is not listed as inter-RAT neighbour cell).

UE: CELL_DCH (state 6-9) in cell 1 as specified in clause 7.4 of TS 34.108.

Test Procedure

**Table 8.7.2.1-1**

| Parameter | Unit | Cell 1 (UTRA) | | | | | Cell 2 (UTRA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T3 | T4 | T0 | T1 | T2 | T3 | T4 |
| UTRA RF Channel Number | | Mid Range Test Frequency | | | | | Mid Range Test Frequency | | | | |
| CPICH Ec (FDD) | dBm/3.84MHz | -60 | -80 | -60 | -80 | -80 | -80 | -80 | -80 | -80 | -60 |
| PCCPCH_RSCP (TDD) | dBm | -60 | -80 | -60 | -80 | -80 | -80 | -80 | -80 | -80 | -60 |

**Table 8.7.2.1-2**

| Parameter | Unit | Cell 9 (GSM) | | | | |
|---|---|---|---|---|---|---|
| | | T0 | T1 | T2 | T3 | T4 |
| Test Channel | | 1 | | | | |
| RF Signal Level | dBm | -90 | -48 | -90 | -48 | -90 |
| RXLEV_ACCESS_MIN | dBm | -100 | | | | |
| FDD_Qmin | dB | -20 | | | | |
| FDD_Qoffset | dBm | 0 | | | | |

Table 8.7.2.1-1 and table 8.7.2.1-2 illustrate the downlink power to be applied for the 3 cells at various time instants of the test execution. Columns marked "T0" denote the initial conditions, while column marked "T1" and "T2" is to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

The UE is initially brought to CELL_DCH state in Cell 1. The system information block 11 message transmitted in Cell 1 list Cell 9 in the inter-RAT cell info lists.

The SS configures UE to perform inter-RAT ANR measurements for GERAN by sending a LOGGING MEASUREMENT CONFIGURATION message to the UE.

The SS releases the RRC connection and UE enters IDLE mode state.

The SS configures its downlink transmission power settings according to columns "T1" in tables 8.7.2.1-1 and 8.7.2.1-2. The UE performs cell re-selection to Cell 9 and performs location update.

The SS configures its downlink transmission power settings according to columns "T2" in tables 8.7.2.1-1 and 8.7.2.1-2. The UE performs cell re-selection to Cell 1 and performs location update.

The SS page the UE to establish an RRC connection. The SS checks that the UE does not includes the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

The SS configures its downlink transmission power settings according to columns "T3" in tables 8.7.2.1-1 and 8.7.2.1-2. The UE performs cell re-selection to Cell 9 and performs location update.

The SS configures its downlink transmission power settings according to columns "T4" in tables 8.7.2.1-1 and 8.7.2.1-2. The UE performs cell re-selection to Cell 2 and performs location update.

The SS page the UE to establish an RRC connection. The SS checks that the UE includes the IE "ANR Logging Results Available" in the RRC CONNECTION SETUP COMPLETE message.

The SS transmits a UE INFORMATION REQUEST message to retrieve the ANR logging measurements from the UE. The UE respond by a UE INFORMATION RESPONSE message including logged ANR measurements, The SS checks the logged ANR report in the UE INFORMATION RESPONSE message includes an Inter-RAT ANR measurement for Cell 9.

Expected Sequence

Specific Message Contents

| Step | Direction | | Message | Comment |
|---|---|---|---|---|
| | UE | SS | | |
| 1 | | | | The UE is brought to CELL_DCH state in Cell 1 |
| 2 | ← | | LOGGING MEASUREMENT CONFIGURATION | SS transmits this message in Cell 1 on downlink DCCH using AM RLC configuring the UE to perform Inter-RAT ANR measurements for GERAN cell. |
| 3 | ← | | RRC CONNECTION RELEASE | |
| 4 | → | | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 5 | | SS | | The SS switches its downlink transmission power settings to columns "T1" in tables 8.7.2.1-1 and 8.7.2.1-2. |

| 6 | → | CHANNEL REQUEST | The SS receives this burst on the RACH of cell 9(GSM cell). (triggered by UE location update procedure) |
|---|---|---|---|
| 7 | ← | IMMEDIATE ASSIGNMENT | Sent on AGCH. |
| 8 | SS | | The SS completes the Location Update procedure requested by the UE. |
| 9 | ← | CHANNEL RELEASE | The SS transmits a channel release to return the UE to idle mode on Cell 9 |
| 10 | SS | | The SS switches its downlink transmission power settings to columns "T2" in tables 8.7.2.1-1 and 8.7.2.1-2. |
| 11 | → | RRC CONNECTION REQUEST | The SS waits for RRC CONNECTION REQUEST on CCCH from the UE on Cell 1 (triggered by UE location update procedure). |
| 12 | ← | RRC CONNECTION SETUP | |
| 13 | → | RRC CONNECTION SETUP COMPLETE | Note 1 |
| 14 | SS | | The SS completes the Location Update procedure requested by the UE. |
| 15 | ← | RRC CONNECTION RELEASE | |
| 16 | → | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 17 | ← | PAGING TYPE1 | Sent on Cell 1. |
| 18 | → | RRC CONNECTION REQUEST | |
| 19 | ← | RRC CONNECTION SETUP | |
| 20 | → | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is not included. Note 1 |
| 21 | ← | RRC CONNECTION RELEASE | |
| 22 | → | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 1. |
| 23 | SS | | The SS switches its downlink transmission power settings to columns "T3" in tables 8.7.2.1-1 and 8.7.2.1-2. |
| 24 | → | CHANNEL REQUEST | The SS receives this burst on the RACH of cell 9(GSM cell). (triggered by UE location update procedure) |
| 25 | ← | IMMEDIATE ASSIGNMENT | Sent on AGCH. |
| 26 | SS | | The SS completes the Location Update procedure requested by the UE. |
| 27 | ← | CHANNEL RELEASE | The SS transmits a channel release to return the UE to idle mode on Cell 9 |
| 28 | SS | | The SS switches its downlink transmission power settings to columns "T4" in tables 8.7.2.1-1 and 8.7.2.1-2. |

| 29 | → | RRC CONNECTION REQUEST | The SS waits for RRC CONNECTION REQUEST on CCCH from the UE on Cell 2 (triggered by UE location update procedure). |
|----|----|----|----|
| 30 | ← | RRC CONNECTION SETUP | |
| 31 | → | RRC CONNECTION SETUP COMPLETE | Note 1 |
| 32 | SS | | The SS completes the Location Update procedure requested by the UE. |
| 33 | ← | RRC CONNECTION RELEASE | |
| 34 | → | RRC CONNECTION RELEASE COMPLETE | UE moves to IDLE mode state in Cell 2. |
| 35 | ← | PAGING TYPE1 | Sent on Cell 2. |
| 36 | → | RRC CONNECTION REQUEST | |
| 37 | ← | RRC CONNECTION SETUP | |
| 38 | → | RRC CONNECTION SETUP COMPLETE | SS checks that the IE "ANR Logging Results Available" is included. Note 1 |
| 39 | ← | UE INFORMATION REQUEST | |
| 40 | → | UE INFORMATION RESPONSE | SS checks that the "Logged ANR Report Info List" includes a GERAN Inter-RAT ANR measurement for Cell 9 |

Note 1: The SS checking if the IE "ANR Logging Results Available" is included or not in the RRC CONNECTION COMPLETE message is done in steps 20 and 38 and not in steps 13 and 31 as the UE may not log the GSM cell in the "Logged ANR Report Info List" until after the location update procedure has been completed.

Specific Message Contents

SYSTEM INFORMATION BLOCK TYPE 11 Cell 1

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 9 is listed as inter-RAT neighbour cell for cell 1.

SYSTEM INFORMATION BLOCK TYPE 11 Cell 2

Use same message sub-clause 6.1 of TS 34.108, with the exception of that cell 3 is not listed as inter-RAT neighbour cell for cell 2.

LOGGING MEASUREMENT CONFIGURATION (Step 2)

Use the LOGGING MEASUREMENT CONFIGURATION message as defined in [9] (TS 34.108) Clause 9 for condition A1 (RSCP Absolute Threshold), with the exception of the following IEs:

| Information Element | Value/remark |
|----|----|
| **Logged ANR configuration Info** <br> - Inter-RAT ANR for GSM Indicator | TRUE |

RRC CONNECTION SETUP COMPLETE (Step 20)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|----|----|
| ANR Logging Results Available | Check that IE is not present. |

RRC CONNECTION SETUP COMPLETE (Step 38)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark |
|---|---|
| ANR Logging Results Available | Check that IE is set to TRUE. |

UE INFORMATION REQUEST (Step 39)

Use the UE INFORMATION REQUEST message as defined in [9] (TS 34.108) Clause 9 for condition A1 (requesting Logged ANR Report).

UE INFORMATION RESPONSE (Step 40)

Check to see if the same message type found in [9] (TS 34.108) Clause 9 is received, with the following exceptions:

| Information Element | Value/remark | Version |
|---|---|---|
| Logged ANR Report Info | | Rel-10 |
| - Serving PLMN Identity | Checked to see that it is identical to the PLMN identity of Cell 1 | |
| - Serving Cell | Checked to see that it is identical to the Cell ID of Cell 1 | |
| - CHOICE *logged cell info* | GSM | |
| - PLMN Identity | Checked to see that it is identical to the PLMN identify of Cell 9 | |
| - LAC | Checked to see that it is identical to the LAC of Cell 9 | |

#### 8.7.2.1.5 Test requirement

At step 20 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH. IE "ANR Logging Results Available" shall not be included. (TP2)

At step 38 the UE shall transmit a RRC CONNECTION SETUP COMPLETE message on uplink DCCH including the IE "ANR Logging Results Available" (TP2, TP3).

At step 40 the UE shall transmit a UE INFORMATION RESPONSE message including an GERAN Inter-RAT ANR measurement for Cell 9 (TP1,TP2,TP4).

## 8.7.2.1a Void