

8.4 Inter-RAT handover

8.4.1 Inter-RAT handover E-UTRA to UTRA

8.4.1.1 Void

8.4.1.2 Inter-RAT handover / From E-UTRA to UTRA PS / Data

8.4.1.2.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message and a DPCCH PS RAB combination is configured
  for an UTRA cell }
  then { UE transmits a HANDOVER TO UTRAN COMPLETE message on the utra cell }
}
```

8.4.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.4.3.3.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
 - 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
 - 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;

8.4.1.2.3 Test description

8.4.1.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- The UE is previously registered on cell 5.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.4.1.2.3.2 Test procedure sequence

Table 8.4.1.2.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS configures UTRA cell 5 to reference configuration according 36.508 table 4.8.3-1, condition UTRA PS RB. | - | - | - | - |
| 1A | The SS transmits a <i>UECapabilityEnquiry</i> message to request UE radio access capability information for E-UTRA and UTRA. | <-- | <i>UECapabilityEnquiry</i> | - | - |
| 1B | The UE transmit a <i>UECapabilityInformation</i> message on Cell 1. NOTE: The start-PS values received, should be used to configure ciphering on cell 5. | --> | <i>UECapabilityInformation</i> | - | - |
| 2 | The SS transmits a <i>MobilityFromEUTRACommand</i> message on Cell 1. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 3 | Check: Does the UE transmit a HANDOVER TO UTRAN COMPLETE message on cell 5? | --> | HANDOVER TO UTRAN COMPLETE | 1 | P |
| 4 | The SS transmits a SECURITY MODE COMMAND message on Cell 5 in order to activate integrity protection. | <-- | SECURITY MODE COMMAND | - | - |
| 5 | The UE transmits a SECURITY MODE COMPLETE message on Cell 5. | --> | SECURITY MODE COMPLETE | - | - |
| 6 | The SS transmits an UTRAN MOBILITY INFORMATION message to notify CN information on Cell 5. | <-- | UTRAN MOBILITY INFORMATION | - | - |
| 7 | The UE transmits an UTRAN MOBILITY INFORMATION CONFIRM message on Cell 5. | --> | UTRAN MOBILITY INFORMATION CONFIRM | - | - |

8.4.1.2.3.3 Specific message contents

Table 8.4.1.2.3.3-1: *MobilityFromEUTRACommand* (step 2, Table 8.4.1.2.3.2-1)

| Derivation Path: 36.508 table 4.6.1-6 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>MobilityFromEUTRACommand</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>mobilityFromEUTRACommand-r8</i> SEQUENCE { | | | |
| purpose CHOICE { | | | |
| handover SEQUENCE { | | | |
| targetRAT-Type | utra | | |
| targetRAT-MessageContainer | HANDOVER TO UTRAN COMMAND | | |
| nas-SecurityParamFromEUTRA | The 4 least significant bits of the NAS downlink COUNT value | | |
| systemInformation | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.1.2.3.3-2: HANDOVER TO UTRAN COMMAND (Table 8.4.1.2.3.3-1)

| |
|--|
| Derivation Path: 36.508 table 4.7B.1-1, condition UTRA PS RB |
|--|

Table 8.4.1.2.3.3-3: SECURITY MODE COMMAND (step 4, Table 8.4.1.2.3.2-1)

| Derivation Path: 34.108 clause 9.1.1 (SECURITY MODE COMMAND message) | | |
|--|-----------|--------------|
| Information Element | Condition | Value/remark |
| Ciphering mode info | | Not Present |

Table 8.4.1.2.3.3-4: UTRAN MOBILITY INFORMATION (step 6, Table 8.4.1.2.3.2-1)

| Derivation Path: 34.108 clause 9.1.1 (UTRAN MOBILITY INFORMATION message) | |
|---|--------------|
| Information Element | Value/remark |
| CN information info | |
| - PLMN identity | |
| - MCC | 001 |
| - MNC | 01 |
| - CN common GSM-MAP NAS system information | 00 01H |
| - CN domain information list full | |
| - CN domain identity | PS |
| - CN domain specific NAS system information | 01 00H |
| - DRX cycle length coefficient | 7 |
| - CN domain identity | CS |
| - CN domain specific NAS system information | 1E 01H |
| - DRX cycle length coefficient | 7 |

Table 8.4.1.2.3.3-5: UECapabilityEnquiry (step 1A, Table 8.4.1.2.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-22 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| UECapabilityEnquiry ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueCapabilityEnquiry-r8 SEQUENCE { | | | |
| ue-CapabilityRequest SEQUENCE (SIZE (1..maxRAT-Capabilities)) OF SEQUENCE { | 2 entry | | |
| RAT-Type[1] | eutra | | |
| RAT-Type[2] | utra | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.4.1.3 Void

8.4.1.4 Inter-RAT handover / From E-UTRA to UTRA HSDPA / Data

8.4.1.4.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message and a DPCCH and HS-PDSCH PS RAB combination
is configured for an UTRA cell}
  then { UE transmits a HANDOVER TO UTRAN COMPLETE message on the utra cell}
}

```

8.4.1.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in : TS 36.331, clause 5.4.3.3.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
 - 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
 - 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;

8.4.1.4.3 Test description

8.4.1.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- The UE is previously registered on cell 5.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.4.1.4.3.2 Test procedure sequence

Table 8.4.1.4.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS configures UTRA cell 5 to reference configuration according 36.508 table 4.8.3-1, condition UTRA HSDPARB.. | - | - | - | - |
| 1A | The SS transmits a <i>UECapabilityEnquiry</i> message to request UE radio access capability information for E-UTRA and UTRA. | <-- | <i>UECapabilityEnquiry</i> | - | - |
| 1B | The UE transmit a <i>UECapabilityInformation</i> message on Cell 1. NOTE: The start-PS values received, should be used to configure ciphering on cell 5. | --> | <i>UECapabilityInformation</i> | - | - |
| 2 | The SS transmits a <i>MobilityFromEUTRACommand</i> message on Cell 1. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 3 | Check: Does the UE transmit a HANDOVER TO UTRAN COMPLETE message on cell 5? | --> | HANDOVER TO UTRAN COMPLETE | 1 | P |
| 4 | The SS transmits a SECURITY MODE COMMAND message on Cell 5 in order to activate integrity protection. | <-- | SECURITY MODE COMMAND | - | - |
| 5 | The UE transmits a SECURITY MODE COMPLETE message on Cell 5. | --> | SECURITY MODE COMPLETE | - | - |
| 6 | The SS transmits an UTRAN MOBILITY INFORMATION message to notify CN information on Cell 5. | <-- | UTRAN MOBILITY INFORMATION | - | - |
| 7 | The UE transmits an UTRAN MOBILITY INFORMATION CONFIRM message on Cell 5. | --> | UTRAN MOBILITY INFORMATION CONFIRM | - | - |

8.4.1.4.3.3 Specific message contents

Table 8.4.1.4.3.3-1: *MobilityFromEUTRACommand* (step 2, Table 8.4.1.4.3.2-1)

| Derivation Path: 36.508 table 4.6.1-6 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>MobilityFromEUTRACommand</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>mobilityFromEUTRACommand-r8</i> SEQUENCE { | | | |
| purpose CHOICE { | | | |
| handover SEQUENCE { | | | |
| targetRAT-Type | utra | | |
| targetRAT-MessageContainer | HANDOVER TO UTRAN COMMAND | | |
| nas-SecurityParamFromEUTRA | The 4 least significant bits of the NAS downlink COUNT value | | |
| systemInformation | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.1.4.3.3-2: HANDOVER TO UTRAN COMMAND (Table 8.4.1.4.3.3-1)

| |
|--|
| Derivation Path: 36.508 table 4.7B.1-1, condition UTRA HSDPARB |
|--|

Table 8.4.1.4.3.3-3: SECURITY MODE COMMAND (step 4, Table 8.4.1.4.3.2-1)

| Derivation Path: 34.108 clause 9.1.1 (SECURITY MODE COMMAND message) | | |
|--|-----------|--------------|
| Information Element | Condition | Value/remark |
| Ciphering mode info | | Not Present |

Table 8.4.1.4.3.3-4: UTRAN MOBILITY INFORMATION (step 6, Table 8.4.1.4.3.2-1)

| Derivation Path: 34.108 clause 9.1.1 (UTRAN MOBILITY INFORMATION message) | |
|---|--------------|
| Information Element | Value/remark |
| CN information info | |
| - PLMN identity | |
| - MCC | 001 |
| - MNC | 01 |
| - CN common GSM-MAP NAS system information | 00 01H |
| - CN domain information list full | |
| - CN domain identity | PS |
| - CN domain specific NAS system information | 01 00H |
| - DRX cycle length coefficient | 7 |
| - CN domain identity | CS |
| - CN domain specific NAS system information | 1E 01H |
| - DRX cycle length coefficient | 7 |

Table 8.4.1.4.3.3-5: UECapabilityEnquiry (step 1A, Table 8.4.1.4.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-22 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| UECapabilityEnquiry ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueCapabilityEnquiry-r8 SEQUENCE { | | | |
| ue-CapabilityRequest SEQUENCE (SIZE | 2 entry | | |
| (1..maxRAT-Capabilities)) OF SEQUENCE { | | | |
| RAT-Type[1] | eutra | | |
| RAT-Type[2] | utra | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.4.1.5 Inter-RAT Handover / from E-UTRA to UTRA(HSUPA/HSDPA) / Data

8.4.1.5.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message and a E-DCH and HS-DSCH PS RAB combination
is configured for an UTRA cell}
  then { UE transmits a HANDOVER TO UTRAN COMPLETE message on the utra cell}
}

```

8.4.1.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.4.3.3.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
 - 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
 - 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;

8.4.1.5.3 Test description

8.4.1.5.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- The UE is previously registered on cell 5.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.4.1.5.3.2 Test procedure sequence

Table 8.4.1.5.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS configures UTRA cell 5 to reference configuration according 36.508 table 4.8.3-1, condition UTRA HSUPA/HSDPA RB. | - | - | - | - |
| 1A | The SS transmits a <i>UECapabilityEnquiry</i> message to request UE radio access capability information for E-UTRA and UTRA. | <-- | <i>UECapabilityEnquiry</i> | - | - |
| 1B | The UE transmit a <i>UECapabilityInformation</i> message on Cell 1. NOTE: The start-PS values received, should be used to configure ciphering on cell 5. | --> | <i>UECapabilityInformation</i> | - | - |
| 2 | The SS transmits a <i>MobilityFromEUTRACommand</i> message on Cell 1. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 3 | Check: Does the UE transmit a HANDOVER TO UTRAN COMPLETE message on cell 5? | --> | HANDOVER TO UTRAN COMPLETE | 1 | P |
| 4 | The SS transmits a SECURITY MODE COMMAND message on Cell 5 in order to activate integrity protection. | <-- | SECURITY MODE COMMAND | - | - |
| 5 | The UE transmits a SECURITY MODE COMPLETE message on Cell 5. | --> | SECURITY MODE COMPLETE | - | - |
| 6 | The SS transmits an UTRAN MOBILITY INFORMATION message to notify CN information on Cell 5. | <-- | UTRAN MOBILITY INFORMATION | - | - |
| 7 | The UE transmits an UTRAN MOBILITY INFORMATION CONFIRM message on Cell 5. | --> | UTRAN MOBILITY INFORMATION CONFIRM | - | - |

8.4.1.5.3.3 Specific message contents

Table 8.4.1.5.3.3-1: MobilityFromEUTRACommand (step 2, Table 8.4.1.5.3.2-1)

| Derivation Path: 36.508 table 4.6.1-6 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r8 SEQUENCE { | | | |
| purpose CHOICE { | | | |
| handover SEQUENCE { | | | |
| targetRAT-Type | utra | | |
| targetRAT-MessageContainer | HANDOVER TO UTRAN COMMAND | | |
| nas-SecurityParamFromEUTRA | The 4 least significant bits of the NAS downlink COUNT value | | |
| systemInformation | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.1.5.3.3-2: HANDOVER TO UTRAN COMMAND (Table 8.4.1.5.3.3-1)

| |
|--|
| Derivation Path: 36.508 table 4.7B.1-1, condition UTRA HSUPA/HSDPARB |
|--|

Table 8.4.1.5.3.3-3: SECURITY MODE COMMAND (step 4, Table 8.4.1.5.3.2-1)

| Derivation Path: 34.108 clause 9.1.1 (SECURITY MODE COMMAND message) | | |
|--|-----------|--------------|
| Information Element | Condition | Value/remark |
| Ciphering mode info | | Not Present |

Table 8.4.1.5.3.3-4: UTRAN MOBILITY INFORMATION (step 6, Table 8.4.1.5.3.2-1)

| Derivation Path: 34.108 clause 9.1.1 (UTRAN MOBILITY INFORMATION message) | |
|---|--------------|
| Information Element | Value/remark |
| CN information info | |
| - PLMN identity | |
| - MCC | 001 |
| - MNC | 01 |
| - CN common GSM-MAP NAS system information | 00 01H |
| - CN domain information list full | |
| - CN domain identity | PS |
| - CN domain specific NAS system information | 01 00H |
| - DRX cycle length coefficient | 7 |
| - CN domain identity | CS |
| - CN domain specific NAS system information | 1E 01H |
| - DRX cycle length coefficient | 7 |

Table 8.4.1.5.3.3-5: UECapabilityEnquiry (step 1A, Table 8.4.1.5.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-22 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| UECapabilityEnquiry ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueCapabilityEnquiry-r8 SEQUENCE { | | | |
| ue-CapabilityRequest SEQUENCE (SIZE (1..maxRAT-Capabilities)) OF SEQUENCE { | 2 entry | | |
| RAT-Type[1] | eutra | | |
| RAT-Type[2] | utra | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.4.2 Inter-RAT handover UTRA to E-UTRA

8.4.2.1 Void

8.4.2.2 Inter-RAT handover / From UTRA PS to E-UTRA / Data

8.4.2.2.1 Test Purpose (TP)

(1)

```

with { UE in UTRA CELL_DCH(P5-DCH+DTCH_DCH) state }
ensure that {
  when { UE receives a HANDOVER FROM UTRAN COMMAND message including the eutra-Message }
  then { UE transmits an RRCConnectionReconfigurationComplete message and enters E-UTRA
RRC_CONNECTED state }
}

```

8.4.2.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.4.2.3.

[TS 36.331, clause 5.4.2.3]

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> start timer T304 with the timer value set to *t304*, as included in the *mobilityControlInfo*;
- 1> consider the target cell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;
- 1> start synchronising to the DL of the target cell;
- 1> set the C-RNTI to the value of the *newUE-Identity*;
- 1> for the target cell, apply the downlink bandwidth indicated by the *dl-Bandwidth*;
- 1> for the target cell, apply the uplink bandwidth indicated by (the absence or presence of) the *ul-Bandwidth*;
- 1> perform the radio resource configuration procedure as specified in 5.3.10;
- 1> forward the *nas-SecurityParamToEUTRA* to the upper layers;

- 1> derive the K_{eNB} key, as specified in TS 33.401 [32];
- 1> store the *nextHopChainingCount* value;
- 1> derive the K_{RRcInt} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
- 1> derive the K_{RRcEnc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];
- 1> configure lower layers to apply the indicated integrity protection algorithm and the K_{RRcInt} key immediately, i.e. the indicated integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> configure lower layers to apply the indicated ciphering algorithm, the K_{RRcEnc} key and the K_{UPenc} key immediately, i.e. the indicated ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> if the *RRConnectionReconfiguration* message includes the *measConfig*:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
- 1> submit the *RRConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;
- 1> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;
- 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the configuration that do not require the UE to know the SFN of the target cell;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target cell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target cell;
 - 2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

8.4.2.2.3 Test description

8.4.2.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle mode (state 2) on Cell 1 (serving cell) according to [18].

8.4.2.2.3.2 Test procedure sequence

Table 8.4.2.2.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Subsequent configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.4.2.2.3.2-2.

Table 8.4.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Remark |
|----|--------------------------|---------------|--------|--------|---|
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -90 | - | The power level values are assigned to satisfy $\text{Thresh}_{x,\text{high}} < \text{Srxlev}_{\text{cell } 5}$. |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | - | -65 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.2 8 MHz | - | -65 | |
| T2 | 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 | - | -85 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.2 8 MHz | - | -85 | |

Table 8.4.2.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 0 | Wait for 6 s for UE to receive system information. | - | - | - | - |
| 1 | The SS changes Cell 1 and Cell 5 level according to the row "T1" in table 8.4.2.2.3.2-1. | - | - | - | - |
| 2 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 3-4 | Void | - | - | - | - |
| 4A-4E | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA PS RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs Network initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | For UTRAN FDD, EXCEPTION: Steps 5a1 to 5a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. For UTRAN TDD, goto step8. | - | - | - | - |
| 5a1 | IF <code>pc_UTRA_CompressedModeRequired</code> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 5a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 6-7 | Void | - | - | - | - |
| 8 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 9 | The SS changes Cell 1 and Cell 5 level according to the row "T2" in table 8.4.2.2.3.2-1. | - | - | - | - |
| 10 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 11 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 12 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1 using the security key derived from the new K_{eNB} ? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 12A | Generic test procedure in TS 36.508 subclause 6.4.2.10 is performed on Cell 1. NOTE: The UE performs tracking area updating procedure without ISR and security reconfiguration after successful completion of handover from UTRA. | - | - | - | - |
| 13-19 | Void | - | - | - | - |
| 20 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC CONNECTED state on Cell 1? | - | - | 1 | - |

8.4.2.2.3.3 Specific message contents

Table 8.4.2.2.3.3-1: Void**Table 8.4.2.2.3.3-2: SystemInformationBlockType6 for Cell 1 (preamble, Table 8.4.2.2.3.2-2)**

| Derivation Path: 36.508, Table 4.4.3.3-5 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType6 ::= SEQUENCE { | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE { | | | UTRA-FDD |
| carrierFreq[n] | Same downlink UARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[1] | 0 | | |
| } | | | |
| carrierFreqListUTRA-TDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE { | The same number of entries as the configured UTRA TDD carriers | | UTRA-TDD |
| carrierFreq[1] | Same downlink ARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[n] | 0 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.4.2.2.3.3-3: Void**Table 8.4.2.2.3.3-4: Void****Table 8.4.2.2.3.3-5: HANDOVER FROM UTRAN COMMAND (step 11, Table 8.4.2.2.3.2-2)**

| |
|---|
| Derivation Path: 36.508, Table 4.7B.1-2 |
|---|

Table 8.4.2.2.3.3-6: RRCConnectionReconfiguration (Table 8.4.2.2.3.3-5)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO-TO-EUTRA(1,0) |
|--|

Table 8.4.2.2.3.3-7: MobilityControlInfo (Table 8.4.2.2.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 1. | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 1. | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| carrierBandwidth SEQUENCE { | | | |
| dl-Bandwidth | Downlink system bandwidth under test. | | |
| ul-Bandwidth | Uplink Bandwidth under test. | | FDD |
| ul-Bandwidth | Not present | | TDD |
| } | | | |
| additionalSpectrumEmission | 1 | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

Table 8.4.2.2.3.3-8: SecurityConfigHO (Table 8.4.2.2.3.3-5)

| Derivation Path: 36.508, Table 4.6.4-1 | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| SecurityConfigHO ::= SEQUENCE { | | | |
| handoverType CHOICE { | | | |
| interRAT SEQUENCE { | | | |
| securityAlgorithmConfig SEQUENCE { | | | |
| cipheringAlgorithm | Set according to PIXIT parameter for default ciphering protection algorithm | | |
| integrityProtAlgorithm | Set according to PIXIT parameter for default integrity algorithm | | |
| } | | | |
| nas-SecurityParamToEUTRA | <p>Octets 1 to 4 are arbitrarily selected.</p> <p>Bits 1 to 3 of octet 5 are set according to PIXIT parameter for default integrity protection algorithm.</p> <p>Bits 5 to 7 of octet 5 are set according to PIXIT parameter for default ciphering algorithm.</p> <p>Bits 1 to 3 of octet 6 are arbitrarily selected between '000'B and '110'B, different from the valid NAS key set identifier of the UE if such a value exists.</p> <p>Bit 4 of octet 6 is set to 1.</p> | <p>Octets 1 to 4 include the NonceMME value.</p> <p>Bits 1 to 3 of octet 5 include the Type of integrity protection algorithm</p> <p>Bits 5 to 7 of octet 5 include the Type of ciphering algorithm.</p> <p>Bits 1 to 4 of octet 6 include the NAS key set identifier.</p> | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.2.2.3.3-9: MEASUREMENT CONTROL (step 8, Table 8.4.2.2.3.2-2)

| Derivation Path: 36.508, clause 4.7B.1-3 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| - Inter-RAT measurement quantity | | | |
| - Measurement quantity for UTRAN quality estimate | | | |
| - Filter coefficient | 0 | | |
| - CHOICE mode | FDD | | |
| - Measurement quantity | CPICH RSCP | | |
| - CHOICE system | E-UTRA | | |
| - Measurement quantity | RSRP | | |
| - Filter coefficient | 0 | | |
| - Inter-RAT reporting quantity | | | |
| - UTRAN estimated quality | FALSE | | |
| - CHOICE system | E-UTRA | | |
| - Reporting quantity | both | | |
| - Reporting cell status | Not present | | |
| - CHOICE report criteria | Inter-RAT measurement reporting criteria | | |
| - Parameters required for each event | 1 entry | | |
| - Inter-RAT event identity | 3a | | |
| - Threshold own system | -66 | | |

| | | | |
|------------------------------------|---|--|--|
| - W | 0 | | |
| - Threshold other system | -80 | | |
| - Hysteresis | 0 | | |
| - Time to trigger | 10 ms | | |
| - Reporting cell status | | | |
| - CHOICE reported cell | Report cells within active set or within virtual active set or of the other RAT | | |
| - Maximum number of reported cells | 2 | | |

Table 8.4.2.3.3-10: System Information Block type 19 for Cell 5 (preamble, Table 8.4.2.3.2-2)

| Derivation Path: 36.508 clause 4.4.4.1, Table 4.4.4.1-1 | | | |
|---|--------------|-----------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SeqInfoType19 ::= SEQUENCE { | | | |
| ultra-PriorityInfoList SEQUENCE { | | | |
| ultra-ServingCell SEQUENCE { | | | |
| Priority | 5 | higher priority than E-UTRA | |
| } | | | |
| } | | | |
| } | | | |

8.4.2.3 Void

8.4.2.4 Inter-RAT handover / From UTRA HSPA to E-UTRA / Data

8.4.2.4.1 Test Purpose (TP)

(1)

```

with { UE in UTRA CELL_DCH(PS-DCH+DTCH_HS-DSCH) state }
ensure that {
  when { UE receives a HANDOVER FROM UTRAN COMMAND message including the eutra-Message }
  then { UE transmits an RRCConnectionReconfigurationComplete message and enters E-UTRA
RRC_CONNECTED state }
}

```

8.4.2.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.4.2.3.

[TS 36.331, clause 5.4.2.3]

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> start timer T304 with the timer value set to *t304*, as included in the *mobilityControlInfo*;
- 1> consider the target cell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;
- 1> start synchronising to the DL of the target cell;
- 1> set the C-RNTI to the value of the *newUE-Identity*;
- 1> for the target cell, apply the downlink bandwidth indicated by the *dl-Bandwidth*;
- 1> for the target cell, apply the uplink bandwidth indicated by (the absence or presence of) the *ul-Bandwidth*;

- 1> perform the radio resource configuration procedure as specified in 5.3.10;
- 1> forward the *nas-SecurityParamToEUTRA* to the upper layers;
- 1> derive the K_{eNB} key, as specified in TS 33.401 [32];
- 1> store the *nextHopChainingCount* value;
- 1> derive the K_{RRCint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
- 1> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];
- 1> configure lower layers to apply the indicated integrity protection algorithm and the K_{RRCint} key immediately, i.e. the indicated integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> configure lower layers to apply the indicated ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key immediately, i.e. the indicated ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
- 1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;
- 1> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;
- 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the configuration that do not require the UE to know the SFN of the target cell;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target cell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target cell;
 - 2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

8.4.2.4.3 Test description

8.4.2.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle mode (state 2) on Cell 1 (serving cell) according to [18].

8.4.2.4.3.2 Test procedure sequence

Table 8.4.2.4.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Subsequent configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.4.2.4.3.2-2.

Table 8.4.2.4.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Remark |
|----|--------------------------|---------------|--------|--------|---|
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -90 | - | The power level values are assigned to satisfy $\text{Thresh}_{x,\text{high}} < \text{Srxlev}_{\text{cell } 5}$. |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | - | -65 | |
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.2 8 MHz | - | -65 | |
| T2 | 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 | - | -85 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.2 8 MHz | - | -85 | |

Table 8.4.2.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 and Cell 5 level according to the row "T1" in table 8.4.2.4.3.2-1. | - | - | - | - |
| 2 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 3-4 | Void | - | - | - | - |
| 4A-4E | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA HSDPA RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs Network initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | UTRAN FDD: EXCEPTION: Steps 5a1 to 5a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. UTRAN TDD : go to step 8 | - | - | - | - |
| 5a1 | IF <code>pc_UTRA_CompressedModeRequired</code> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 5a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 6-7 | Void | - | - | - | - |
| 8 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 9 | The SS changes Cell 1 and Cell 5 level according to the row "T2" in table 8.4.2.4.3.2-1. | - | - | - | - |
| 10 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 11 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 12 | Check: Does the UE transmit an <i>RRConnectionReconfigurationComplete</i> message on Cell 1 using the security key derived from the new K_{eNB} ? | --> | <i>RRConnectionReconfigurationComplete</i> | 1 | P |
| 12 A | Generic test procedure in TS 36.508 subclause 6.4.2.10 is performed on Cell 1. NOTE: The UE performs tracking area updating procedure without ISR and security reconfiguration after successful completion of handover from UTRA. | - | - | - | - |
| 13-19 | Void | - | - | - | - |
| 20 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC CONNECTED state on Cell 1? | - | - | 1 | - |

8.4.2.4.3.3 Specific message contents

Table 8.4.2.4.3.3-1: Void**Table 8.4.2.4.3.3-2: SystemInformationBlockType6 for Cell 1 (preamble, Table 8.4.2.4.3.2-2)**

| Derivation Path: 36.508, Table 4.4.3.3-5 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType6 ::= SEQUENCE { | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE { | | | UTRA-FDD |
| carrierFreq[n] | Same downlink UARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[n] | 0 | | |
| } | | | |
| carrierFreqListUTRA-TDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE { | | | UTRA-TDD |
| carrierFreq[n] | Same downlink UARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[n] | 0 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.4.2.4.3.3-3: Void**Table 8.4.2.4.3.3-4: Void****Table 8.4.2.4.3.3-5: HANDOVER FROM UTRAN COMMAND (step 11, Table 8.4.2.4.3.2-2)**

| Derivation Path: 36.508, Table 4.7B.1-2 |
|---|
|---|

Table 8.4.2.4.3.3-6: RRCConnectionReconfiguration (Table 8.4.2.4.3.3-5)

| Derivation Path: 36.508, Table 4.6.1-8, condition HO-TO-EUTRA(1,0) |
|--|
|--|

Table 8.4.2.4.3.3-7: MobilityControlInfo (Table 8.4.2.4.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 1. | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 1. | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| carrierBandwidth SEQUENCE { | | | |
| dl-Bandwidth | Downlink system bandwidth under test. | | |
| ul-Bandwidth | Uplink Bandwidth under test. | | FDD |
| ul-Bandwidth | Not present | | TDD |
| } | | | |
| additionalSpectrumEmission | 1 | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

Table 8.4.2.4.3.3-8: SecurityConfigHO (Table 8.4.2.4.3.3-5)

| Derivation Path: 36.508, Table 4.6.4-1 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| SecurityConfigHO ::= SEQUENCE { | | | |
| handoverType CHOICE { | | | |
| interRAT SEQUENCE { | | | |
| securityAlgorithmConfig SEQUENCE { | | | |
| cipheringAlgorithm | Set according to PIXIT parameter for default ciphering protection algorithm | | |
| integrityProtAlgorithm | Set according to PIXIT parameter for default integrity algorithm | | |
| } | | | |
| nas-SecurityParamToEUTRA | <p>Octets 1 to 4 set to 11223344.</p> <p>Bits 1 to 3 of octet 5 are set according to PIXIT parameter for default integrity protection algorithm.</p> <p>Bits 5 to 7 of octet 5 are set according to PIXIT parameter for default ciphering algorithm.</p> <p>Bits 1 to 3 of octet 6 are set to the NAS key set identifier of the current security context.</p> <p>Bit 4 of octet 6 is set to 1.</p> | <p>Octets 1 to 4 include the NonceMME value and are arbitrarily selected.</p> <p>Bits 1 to 3 of octet 5 include the Type of integrity protection algorithm</p> <p>Bits 5 to 7 of octet 5 include the Type of ciphering algorithm.</p> <p>Bits 1 to 4 of octet 6 include the NAS key set identifier.</p> | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.2.4.3.3-9: PHYSICAL CHANNEL RECONFIGURATION (step 5a1, Table 8.4.2.4.3.2-2)

| Derivation Path: 34.108 clause 9.1.1 (PHYSICAL CHANNEL RECONFIGURATION message) | |
|---|-----------------|
| Information Element | Value/remark |
| - CHOICE mode | FDD |
| - 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 | 10 |
| - TGL2 | Not Present |
| - TGD | 270 |
| - TGPL1 | 12 |
| - TGPL2 | Not Present |
| - RPP | mode 0 |
| - ITP | mode 0 |

| Derivation Path: 34.108 clause 9.1.1 (PHYSICAL CHANNEL RECONFIGURATION message) | |
|---|---|
| Information Element | Value/remark |
| - CHOICE UL/DL Mode | UL and DL, UL only, or DL only, depending on UE capability |
| - Downlink compressed mode method | SF/2 or Not present depending on UE capability |
| - Uplink compressed mode method | Higher Layer Scheduling or Not Present depending on UE capability |
| - Downlink frame type | B |
| - DeltaSIR1 | 20 (2.0) |
| - DeltaSIRAfter1 | 10 (1.0) |
| - DeltaSIR2 | Not Present |
| - DeltaSIRAfter2 | Not Present |
| - N identify abort | Not Present |
| - T Reconfirm abort | Not Present |

Table 8.4.2.4.3.3-10: System Information Block type 19 for Cell 5 (preamble, Table 8.4.2.4.3.2-2)

| Derivation Path: 36.508 clause 4.4.4.1, Table 4.4.4.1-1 | | | |
|---|--------------|-----------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SysInfoType19 ::= SEQUENCE { | | | |
| utra-PriorityInfoList SEQUENCE { | | | |
| utra-ServingCell SEQUENCE { | | | |
| Priority | 5 | higher priority than E-UTRA | |
| } | | | |
| } | | | |
| } | | | |

8.4.2.5 Void

8.4.2.6 Void

8.4.2.7 CA / RRC connection reconfiguration / Handover UTRAN to E-UTRAN/ Success / SCell addition

8.4.2.7.1 CA / RRC connection reconfiguration / Handover UTRAN to E-UTRAN/ Success / SCell addition / Intra-band Contiguous CA

8.4.2.7.1.1 Test Purpose (TP)

(1)

```
with { UE in UTRA CELL_DCH(PS-DCCH+DTCH_HS-DSCH) state }
ensure that {
  when { UE receives a HANDOVER FROM UTRAN COMMAND message including the eutra-Message with
  RRCConnectionReconfiguration including the sCellToAddModList }
  then { UE transmits an RRCConnectionReconfigurationComplete message and enters E-UTRA
  RRC_CONNECTED state with both PCell and SCell }
}
```

8.4.2.7.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: Reference TS 36.331 clause 5.4.2.3, and 5.3.10.3b]

[TS 36.331, clause 5.4.2.3]

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;

- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> start timer T304 with the timer value set to t_{304} , as included in the *mobilityControlInfo*;
- 1> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;
- 1> start synchronising to the DL of the target PCell;
- 1> set the C-RNTI to the value of the *newUE-Identity*;
- 1> for the target PCell, apply the downlink bandwidth indicated by the *dl-Bandwidth*;
- 1> for the target PCell, apply the uplink bandwidth indicated by (the absence or presence of) the *ul-Bandwidth*;
- 1> configure lower layers in accordance with the received *radioResourceConfigCommon*;
- 1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received *mobilityControlInfo*;
- 1> perform the radio resource configuration procedure as specified in 5.3.10;
- 1> forward the *nas-SecurityParamToEUTRA* to the upper layers;
- 1> derive the K_{eNB} key, as specified in TS 33.401 [32];
- 1> derive the $K_{RRCi_{int}}$ key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
- 1> derive the $K_{RRCe_{nc}}$ key and the $K_{UP_{enc}}$ key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];
- 1> configure lower layers to apply the indicated integrity protection algorithm and the $K_{RRCi_{int}}$ key immediately, i.e. the indicated integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> configure lower layers to apply the indicated ciphering algorithm, the $K_{RRCe_{nc}}$ key and the $K_{UP_{enc}}$ key immediately, i.e. the indicated ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> if the received *RRCCConnectionReconfiguration* includes the *sCellToAddModList*:
 - 2> perform SCell addition as specified in 5.3.10.3b;
- 1> if the *RRCCConnectionReconfiguration* message includes the *measConfig*:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> if the *RRCCConnectionReconfiguration* message includes the *reportProximityConfig*:
 - 2> perform the proximity indication configuration in accordance with the received *reportProximityConfig*;
- 1> set the content of *RRCCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include the *logMeasAvailable*;
- 1> submit the *RRCCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;
- 1> if the *RRCCConnectionReconfiguration* message does not include *rlf-TimersAndConstants* set to *setup*:

- 2> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;
- 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;

NOTE 1: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.

- 2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

NOTE 2: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

[TS 36.331, clause 5.3.10b]

The UE shall:

- 1> for each *sCellIndex* value included in the *sCellToAddModList* that is not part of the current UE configuration (SCell addition):
 - 2> add the SCell, corresponding to the *cellIdentification*, in accordance with the received *radioResourceConfigCommonSCell* and *radioResourceConfigDedicatedSCell*;
 - 2> configure lower layers to consider the SCell to be in deactivated state;
- 1> for each *sCellIndex* value included in the *sCellToAddModList* that is part of the current UE configuration (SCell modification):
 - 2> modify the SCell configuration in accordance with the received *radioResourceConfigDedicatedSCell*;

8.4.2.7.1.3 Test description

8.4.2.7.1.3.1 Pre-test conditions

System Simulator:

- Cell 5 is UTRAN Cell
- Cell 1 is the PCell, Cell 3 is SCell to be added
- Cell 3 is an Inactive SCell according to [18] cl. 6.3.4
- System information combination 9 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- None

Preamble:

- The UE is in state Registered, Idle mode (state 2) on Cell 1 according to [18].

8.4.2.7.1.3.2 Test procedure sequence

Table 8.4.2.7.1.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Subsequent configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.4.2.7.1.3.2-2.

Table 8.4.2.7.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Cell 5 | Remark |
|----|--------------------------|---------------|--------|--------|--------|---|
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -90 | -90 | | The power level values are assigned to satisfy $\text{Thresh}_{x,\text{high}} < S_{rx} \text{lev}_{\text{cell } 5}$. |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | - | - | -65 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.2 8 MHz | - | - | -65 | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | -70 | -70 | - | The power level values are such that entering conditions for event 3a are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.8 4 MHz | - | - | -85 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.2 8 MHz | - | - | -85 | |

Table 8.4.2.7.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-----|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 5, Cell 1 and Cell 3 level according to the row "T1" in table 8.4.2.7.1.3.2-1. | - | - | - | - |
| 2 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 3-7 | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA HSDPA RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs Network initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | EXCEPTION: Steps 8a1 to 8a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. | - | - | - | - |
| 8a1 | IF <code>pc_FDD AND pc_UTRA_CompressedModeRequired</code> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 8a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 9 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 10 | The SS changes Cell 5, Cell 1 and Cell 3 level according to the row "T2" in table 8.4.2.7.1.3.2-1. | - | - | - | - |
| 11 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 12 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 13 | Check: Does the UE transmit an <i>RRConnectionReconfigurationComplete</i> message on Cell 1 to confirm the successful completion of the handover and SCell addition of Cell 3? | --> | <i>RRConnectionReconfigurationComplete</i> | 1 | P |
| 14 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicates that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 1 | - |

8.4.2.7.1.3.3 Specific message contents

Table 8.4.2.7.1.3.3-1: SystemInformationBlockType6 for Cell 1 (preamble, Table 8.4.2.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-5 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType6 ::= SEQUENCE { | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE { | | | UTRA-FDD |
| carrierFreq[n] | Same downlink UARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[1] | 0 | | |
| } | | | |
| carrierFreqListUTRA-TDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE { | | | UTRA-TDD |
| carrierFreq[1] | The same number of entries as the configured UTRA TDD carriers | | |
| cellReselectionPriority[n] | Same downlink ARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[n] | 0 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.4.2.7.1.3.3-2: MEASUREMENT CONTROL (step 9, Table 8.4.2.7.1.3.2-2)

| Derivation Path: 36.508, clause 4.7B.1-3 | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| - Inter-RAT measurement quantity | | | |
| - Measurement quantity for UTRAN quality estimate | | | |
| - Filter coefficient | 0 | | |
| - CHOICE mode | FDD | | |
| - Measurement quantity | CPICH RSCP | | |
| - CHOICE system | E-UTRA | | |
| - Measurement quantity | RSRP | | |
| - Filter coefficient | 0 | | |
| - Inter-RAT reporting quantity | | | |
| - UTRAN estimated quality | FALSE | | |
| - CHOICE system | E-UTRA | | |
| - Reporting quantity | both | | |
| - Reporting cell status | Not present | | |
| - CHOICE report criteria | Inter-RAT measurement reporting criteria | | |
| - Parameters required for each event | 1 entry | | |
| - Inter-RAT event identity | 3a | | |
| - Threshold own system | -66 | | |
| - W | 0 | | |
| - Threshold other system | -80 | | |
| - Hysteresis | 0 | | |
| - Time to trigger | 10 ms | | |
| - Reporting cell status | | | |
| - CHOICE reported cell | Report cells within active set or within virtual active set or of the other RAT | | |
| - Maximum number of reported cells | 2 | | |

Table 8.4.2.7.1.3.3-3: HANDOVER FROM UTRAN COMMAND (step 12, Table 8.4.2.7.1.3.2-2)

Derivation Path: 36.508, Table 4.7B.1-2

Table 8.4.2.7.1.3.3-4: *RRConnectionReconfiguration* (Table 8.4.2.7.1.3.3-3)

Derivation Path: 36.508, Table 4.6.1-8, condition HO-TO-EUTRA(1,0) and SCell_AddMod

Table 8.4.2.7.1.3.3-5: *MobilityControlInfo* (Table 8.4.2.7.1.3.3-4)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 1. | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 1. | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| carrierBandwidth SEQUENCE { | | | |
| dl-Bandwidth | Downlink system bandwidth under test. | | |
| ul-Bandwidth | Uplink Bandwidth under test. | | FDD |
| ul-Bandwidth | Not present | | TDD |
| } | | | |
| additionalSpectrumEmission | 1 | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

Table 8.4.2.7.1.3.3-6: SecurityConfigHO (Table 8.4.2.7.1.3.3-4)

| Derivation Path: 36.508, Table 4.6.4-1 | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| SecurityConfigHO ::= SEQUENCE { | | | |
| handoverType CHOICE { | | | |
| interRAT SEQUENCE { | | | |
| securityAlgorithmConfig SEQUENCE { | | | |
| cipheringAlgorithm | Set according to PIXIT parameter for default ciphering protection algorithm | | |
| integrityProtAlgorithm | Set according to PIXIT parameter for default integrity algorithm | | |
| } | | | |
| nas-SecurityParamToEUTRA | <p>Octets 1 to 4 are arbitrarily selected.</p> <p>Bits 1 to 3 of octet 5 are set according to PIXIT parameter for default integrity protection algorithm.</p> <p>Bits 5 to 7 of octet 5 are set according to PIXIT parameter for default ciphering algorithm.</p> <p>Bits 1 to 3 of octet 6 are arbitrarily selected between '000'B and '110'B, different from the valid NAS key set identifier of the UE if such a value exists.</p> <p>Bit 4 of octet 6 is set to 1.</p> | <p>Octets 1 to 4 include the NonceMME value.</p> <p>Bits 1 to 3 of octet 5 include the Type of integrity protection algorithm</p> <p>Bits 5 to 7 of octet 5 include the Type of ciphering algorithm.</p> <p>Bits 1 to 4 of octet 6 include the NAS key set identifier.</p> | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.2.7.1.3.3-7: SCellToAddMod-r10-f2 (Table 8.4.2.7.1.3.3-4)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.3-19D SCellToAddMod-r10-DEFAULT | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SCellToAddMod-r10 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SEQUENCE { | 1 entry | | |
| sCellIndex-r10 | 1 | | |
| cellIdentification-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical Cell Identity of Cell 3 | | |
| dl-CarrierFreq-r10 | Same downlink EARFCN as used for Cell 3 | | |
| } | | | |
| radioResourceConfigCommonSCell-r10 | RadioResourceConfigCommonSCell-r10-f2 | | |
| } | | | |

Table 8.4.2.7.1.3.3-8: RadioResourceConfigCommonSCell-r10-f2 (Table 8.4.2.7.1.3.3-7)

| Derivation Path: 36.508 clause 4.6.3 table 4.6.3-13A | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RadioResourceConfigCommonSCell-r10 ::= SEQUENCE { | | | |
| nonUL-Configuration-r10 SEQUENCE { | | | |
| dl-Bandwidth-r10 | Same downlink system bandwidth as used for Cell 3 | | |
| } | | | |
| } | | | |

8.4.2.7.2 CA / RRC connection reconfiguration / Handover UTRAN to E-UTRAN/ Success / SCell addition / Inter-band CA

The scope and description of the present TC is the same as test case 8.4.2.7.1 with the following differences:

- CA configuration: Inter-band CA replaces Intra-band Contiguous CA
- Cells configuration: Cell 10 replaces Cell 3
 - Cell 10 is an Inactive SCell according to [18] cl. 6.3.4

8.4.3 Inter-RAT mobility E-UTRA to GERAN

8.4.3.1 Inter-RAT handover / From E-UTRA to GPRS / PS HO

8.4.3.1.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA (data) RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message including radio resources that have been
  allocated for the UE in the target cell }
  then { UE successfully completes the handover and leaves the RRC_CONNECTED, enter the
  GPRS_Packet_Transfer_Mode }
}

```

8.4.3.1.2 Conformance requirements [D]

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.4.3.3, 5.4.3.4.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
 - 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
 - 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;
 - 3> if the *targetRAT-Type* is set to 'geran':

- 4> use the contents of *systemInformation*, if provided for PS Handover, as the system information to begin access on the target GERAN cell;

NOTE 1: If there are DRBs for which no radio bearers are established in the target RAT as indicated in the *targetRAT-MessageContainer* in the message, the E-UTRA RRC part of the UE does not indicate the release of the concerned DRBs to the upper layers. Upper layers may derive which bearers are not established from information received from the AS of the target RAT.

[TS 36.331, clause 5.4.3.4]

Upon successfully completing the handover or the cell change order, the UE shall:

- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 1> stop timer T304, if running;

8.4.3.1.3 Test description

8.4.3.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 24 - Cell 1 is an E-UTRAN cell, Cell 24 is a GERAN cell.
- All cells belong to the same PLMN.
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- None.

Preamble:

- UE is in state3 (Generic RB Established) in cell 1 as specified in clause 4.5.3 of TS 36.508.

8.4.3.1.3.2 Test procedure sequence

Table 8.4.3.1.3.2-1 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 condition after preamble, while columns 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 8.4.3.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 24 | Remark |
|----|-----------------------|------------|--------|---------|--------|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -60 | - | - |
| | RSSI | dBm | - | [-85] | - |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | - |
| | RSSI | dBm | - | [-65] | - |

Table 8.4.3.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|----------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS configures cell 1 and GERAN cell 24 according to the row "T1" in Table 8.4.3.1.3.2-1 | - | - | - | - |
| 2 | The SS transmits a <i>MobilityFromEUTRACCommand</i> message on Cell 1. | <-- | <i>MobilityFromEUTRACCommand</i> | - | - |
| 3 | Check: Does the UE transmit a PS HANDOVER ACCESS message on cell 24? | --> | PS HANDOVER ACCESS | 1 | P |

8.4.3.1.3.3 Specific message contents

Table 8.4.3.1.3.3-1: *MobilityFromEUTRACommand* (step 2, Table 8.4.1.2.3.2-1)

| Derivation Path: 36.508 table 4.6.1-6 | | | |
|---|---------------------|------------------------|------------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r8 SEQUENCE { | | | |
| CS-FallbackIndicator | false | Applies only for Rel.9 | |
| purpose CHOICE { | | | |
| handover SEQUENCE { | | | |
| targetRAT-Type | geran | | |
| targetRAT-MessageContainer | PS HANDOVER COMMAND | | |
| nas-SecurityParamFromEUTRA | | | UTRAGER AN |
| systemInformation | PSI-GERAN | | PS HO |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.3.1.3.3-2: PS HANDOVER COMMAND (Table 8.4.3.1.3.3-1)

| Derivation Path: TS 36.508, Table 4.7D.1-1: PS HANDOVER COMMAND | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| NAS Container for PS Handover | Present | | |

Table 8.4.3.1.3.3-3: NAS Container for PS Handover (Table 8.4.3.1.3.3-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------------|--------------|-----------------------------------|-----------|
| NAS_CONTAINER_LENGTH | Present | Set accordingly | |
| Type of ciphering algorithm | Present | | |
| old XID | Present | Reset with the old XID parameters | |
| IOV-UI value | '00000000'O | | |

8.4.3.2 Inter-RAT cell change order / From E-UTRA data RRC_CONNECTED to GPRS / Without NACC

8.4.3.2.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA (data) RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message including information facilitating access of the target cell }
  then { UE successfully completing the cell change order and leaves the RRC_CONNECTED, enter the GPRS_Packet_Idle }
}

```

8.4.3.2.2 Conformance requirements[D]

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.4.3.3, 5.4.3.4.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
 - 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
 - 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;
 - 3> if the *targetRAT-Type* is set to 'geran':
 - 4> use the contents of *systemInformation*, if provided for PS Handover, as the system information to begin access on the target GERAN cell;

NOTE 1: If there are DRBs for which no radio bearers are established in the target RAT as indicated in the *targetRAT-MessageContainer* in the message, the E-UTRA RRC part of the UE does not indicate the release of the concerned DRBs to the upper layers. Upper layers may derive which bearers are not established from information received from the AS of the target RAT.

- 2> else if the *targetRAT-Type* is set to 'cdma2000-1XRTT' or 'cdma2000-HRPD':
 - 3> forward the *targetRAT-Type* and the *targetRAT-MessageContainer* to the CDMA2000 upper layers for the UE to access the cell indicated in the inter-RAT message in accordance with the specifications of the CDMA2000 target-RAT;
- 1> else if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'cellChangeOrder':
 - 2> start timer T304 with the timer value set to *t304*, as included in the *MobilityFromEUTRACommand* message;
 - 2> if the *targetRAT-Type* is set to 'geran':
 - 3> if *networkControlOrder* is included in the *MobilityFromEUTRACommand* message:
 - 4> apply the value as specified in TS 44.060 [36];
 - 3> else:
 - 4> acquire *networkControlOrder* and apply the value as specified in TS 44.060 [36];
 - 3> use the contents of *systemInformation*, if provided, as the system information to begin access on the target GERAN cell;

NOTE 2: The *systemInformation* is constructed in the same way as in 2G to 2G NA CC, i.e. the PSI messages are encoded as such, whereas the SI messages exclude 2 octets of headers, see TS 44.060[36].

- 2> establish the connection to the target cell indicated in the *CellChangeOrder*;

NOTE 3: The criteria for success or failure of the cell change order to GERAN are specified in TS 44.060[36].

[TS 36.331, clause 5.4.3.4]

Upon successfully completing the handover or the cell change order, the UE shall:

- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 1> stop timer T304, if running;

8.4.3.2.3 Test description

8.4.3.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 24 - Cell 1 is an E-UTRAN cell, Cell 24 is a GERAN cell.
- All cells belong to the same PLMN.
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- None.

Preamble:

- UE is in state3 (Generic RB Established) in cell 1 as specified in clause 4.5.3 of TS 36.508.

8.4.3.2.3.2 Test procedure sequence

Table 8.4.3.2.3.2-1 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 condition after preamble, while columns 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 8.4.3.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 24 | Remark |
|----|-----------------------|------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -60 | - | - |
| | RSSI | dBm | - | -85 | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | - |
| | RSSI | dBm | - | -65 | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | -115 | - | The power levels are such that reselection back to cell 1 should not occur |

Table 8.4.3.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message to confirm the setup of inter RAT measurement on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 24 parameters according to the row "T1" in table 8.4.3.2.3.2-1. | - | - | - | - |
| 4 | The UE transmit a <i>MeasurementReport</i> message to report the event B2 for Cell 24. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits a <i>MobilityFromEUTRACommand</i> message on Cell 1. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 5A | The UE transmits a CHANNEL REQUEST message on Cell 24. | --> | CHANNEL REQUEST | - | - |
| 5B | The SS changes cell 1 power level according to the row "T2" | - | - | - | - |
| 6-15 | Check: Does the test result of steps 2-11 in generic test procedure in TS 36.508 subclause 6.4.2.9 indicate that the UE is camped on GERAN Cell 24? NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | 1 | P |

8.4.3.2.3.3 Specific message contents

Table 8.4.3.2.3.3-1: *RRCConnectionReconfiguration* (step 1, Table 8.4.3.2.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.4.3.2.3.3-2: *MeasConfig* (step 1, Table 8.4.3.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition GERAN | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA- GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f11 | | |
| measObject[2] | MeasObjectGERAN- GENERIC(f11) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2- GERAN | | |
| reportConfig[1] | ReportConfigInterRAT- B2-GERAN(-69, -79) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f11 | | |
| reportConfigId[1] | IdReportConfig-B2- GERAN | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigGERAN SEQUENCE { | | | |
| measQuantityGERAN | rsi | | |
| filterCoefficient | fc0 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.3.2.3.3-3: *MobilityFromEUTRACommand* (step 5, Table 8.4.3.2.3.2-2)

| Derivation Path: 36.508 table 4.6.1-6 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-DL | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| mobilityFromEUTRACommand-r8 ::= SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE { | | | |
| cellChangeOrder ::= SEQUENCE { | | | |
| t304 | ms8000 | | |
| targetRAT-Type CHOICE{ | | | |
| geran ::= SEQUENCE { | | | |
| physCellId | 0001H | | |
| carrierFreq ::= SEQUENCE { | | | |
| arfcn | Downlink ARFCN of Cell 24 | | |
| bandIndicator | The same band indicator of the Cell 24 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.4.3.3 Inter-RAT cell change order / From E-UTRA data to GPRS / With NACC

8.4.3.3.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA (data) RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message including information facilitating access of the target cell }
  then { UE successfully completing the cell change order and leaves the RRC_CONNECTED, enter the GPRS_Packet_Idle }
}

```

8.4.3.3.2 Conformance requirements[D]

References: The conformance requirements covered in the present TC are specified in : TS 36.331, clauses 5.4.3.3, 5.4.3.4.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':

- 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
- 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
- 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;
- 3> if the *targetRAT-Type* is set to 'geran':
 - 4> use the contents of *systemInformation*, if provided for PS Handover, as the system information to begin access on the target GERAN cell;

NOTE 1: If there are DRBs for which no radio bearers are established in the target RAT as indicated in the *targetRAT-MessageContainer* in the message, the E-UTRA RRC part of the UE does not indicate the release of the concerned DRBs to the upper layers. Upper layers may derive which bearers are not established from information received from the AS of the target RAT.

- 2> else if the *targetRAT-Type* is set to 'cdma2000-1XRTT' or 'cdma2000-HRPD':
 - 3> forward the *targetRAT-Type* and the *targetRAT-MessageContainer* to the CDMA2000 upper layers for the UE to access the cell indicated in the inter-RAT message in accordance with the specifications of the CDMA2000 target-RAT;
- 1> else if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'cellChangeOrder':
 - 2> start timer T304 with the timer value set to *t304*, as included in the *MobilityFromEUTRACommand* message;
 - 2> if the *targetRAT-Type* is set to 'geran':
 - 3> if *networkControlOrder* is included in the *MobilityFromEUTRACommand* message:
 - 4> apply the value as specified in TS 44.060 [36];
 - 3> else:
 - 4> acquire *networkControlOrder* and apply the value as specified in TS 44.060 [36];
 - 3> use the contents of *systemInformation*, if provided, as the system information to begin access on the target GERAN cell;

NOTE 2: The *systemInformation* is constructed in the same way as in 2G to 2G NACC, i.e. the PSI messages are encoded as such, whereas the SI messages exclude 2 octets of headers, see TS 44.060[36].

- 2> establish the connection to the target cell indicated in the *CellChangeOrder*;

NOTE 3: The criteria for success or failure of the cell change order to GERAN are specified in TS 44.060[36].

[TS 36.331, clause 5.4.3.4]

Upon successfully completing the handover or the cell change order, the UE shall:

- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 1> stop timer T304, if running;

8.4.3.3.3 Test description

8.4.3.3.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 24 - Cell 1 is an E-UTRAN cell, Cell 24 is a GERAN cell.
- All cells belong to the same PLMN.
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

- None.

Preamble:

- UE is in state3 (Generic RB Established)in cell 1 as specified in clause 4.5.3 of TS 36.508.

8.4.3.3.3.2 Test procedure sequence

Table 8.4.3.3.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.4.3.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 24 | Remark |
|----|-----------------------|------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -60 | - | - |
| | RSSI | dBm | - | [-85] | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | - |
| | RSSI | dBm | - | [-65] | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | -115 | - | The power levels are such that reselection back to cell 1 should not occur |

Table 8.4.3.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message to confirm the setup of inter RAT measurement on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1and Cell 24 parameters according to the row "T1" in table 8.4.3.3.3.2-1. | | | - | - |
| 4 | The UE transmit a <i>MeasurementReport</i> message to report the event B2 for Cell 24. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits a <i>MobilityFromEUTRACommand</i> message on Cell 1. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 5A | Check: Does the UE send a CHANNEL REQUEST message on the cell(s) specified in the test case? | --> | CHANNEL REQUEST | 1 | P |
| 5AA | The SS changes cell 1 power level according to the row "T2" | - | - | - | - |
| 5B | An uplink TBF is established in order to allow the UE to transmit a ROUTING AREA UPDATE REQUEST message signalling. | - | - | - | - |
| 5C | The UE transmits a ROUTING AREA UPDATE REQUEST message. | --> | ROUTING AREA UPDATING REQUEST | - | - |
| 5D | the UE transmits a PACKET SI STATUS message | --> | PACKET SI STATUS | | |
| 6 -13 | The reminder (steps 4 – 11) of generic test procedure in TS 36.508 subclause 6.4.2.9 is performed. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | | |

8.4.3.3.3.3 Specific message contents

Table 8.4.3.3.3-1: RRCConnectionReconfiguration (step 1, Table 8.4.3.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition MEAS

Table 8.4.3.3.3-2: MeasConfig (step 1, Table 8.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition GERAN | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f11 | | |
| measObject[2] | MeasObjectGERAN-GENERIC(f11) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-GERAN | | |
| reportConfig[1] | ReportConfigInterRAT-B2-GERAN(-69, [-79]) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f11 | | |
| reportConfigId[1] | IdReportConfig-B2-GERAN | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigGERAN SEQUENCE { | | | |
| measQuantityGERAN | rsSI | | |
| filterCoefficient | fc0 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.3.3.3-3: MobilityFromEUTRACommand (step 5, Table 8.4.3.3.2-2)

| Derivation Path: 36.508 table 4.6.1-6 | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-DL | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| mobilityFromEUTRACommand-r8 ::= SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE { | | | |
| cellChangeOrder ::= SEQUENCE { | | | |
| t304 | ms2000 | | |
| targetRAT-Type CHOICE { | | | |
| geran ::= SEQUENCE { | | | |
| physCellId | 0001H | | |
| carrierFreq ::= SEQUENCE { | | | |
| arfcn | Downlink ARFCN of Cell 24 | | |
| bandIndicator | The same band indicator of the Cell 24 | | |
| } | | | |
| } | | | |
| networkControlOrder | 00 | NC0: MS controlled cell re-selection, no measurement reporting | |
| SI-OrPSI-GERAN ::= CHOICE { | | | PS HO |
| SystemInfoListGERAN ::= SEQUENCE { | | | |
| SYSTEM INFORMATION TYPE 1 | Set according to clause 4.4.5 in TS36.508. | | |
| SYSTEM INFORMATION TYPE 3 | Set according to clause 4.4.5 in TS36.508. | | |
| SYSTEM INFORMATION TYPE 13 | Set according to clause 4.4.5 in TS36.508. | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.3.3.3-4: System Information 13 (Preamble onwards)

| Derivation Path: 51.010, Clause 40.2.1.1.1 | |
|--|--------------------------------------|
| SI 13 Rest Octets - SI_STATUS_IND bit | 1 PACKET SI STATUS message supported |

Table 8.4.3.3.3-5: Packet SI Status

| Information element | Value/remark |
|---|---|
| < GLOBAL_TFI : Global TFI IE > | Present, any Value |
| < BCCH_CHANGE_MARK : bit (3) > | Present, any Value |
| < Received SI Message List : { 1 < SI_MESSAGE_TYPE : bit (8) > { < MESS_REC : bit (2) > } } < SI_MESSAGE_TYPE : bit (8) > { < MESS_REC : bit (2) > } } ** 0 < ADDITIONAL_MSG_TYPE : bit > ; | 1 00011001 (SI1) 01 (Message type supported and received, single instance) 1 00011011 (SI3) 1 Not Checked, The UE may include additional information Present, any Value |
| < Received Unknown SI Message List : { 1 < SI_MESSAGE_TYPE : bit (8) > } ** 0 < ADDITIONAL_MSG_TYPE : bit > ; | 0 (not present) Present, any Value |
| 1 Additions for REL-6 : < PSCSI_SUPPORT : bit > < PS_REL_REQ : bit > | -- Not Checked Not Checked Not Checked |

8.4.4 Void

8.4.5 Inter-RAT handover E-UTRA to HRPD

8.4.5.1 Void

8.4.5.2 Void

8.4.5.3 Void

8.4.5.4 Pre-registration at HRPD and inter-RAT handover / From E-UTRA to HRPD Active / Data

8.4.5.4.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has performed pre-registration on HRPD neighbour cell }
ensure that {
  when { UE receives a HandoverFromEUTRAPreparationRequest message with cdma2000-type set to 'HRPD' }
  then { UE transmits a ULHandoverPreparationTransfer message containing tunnelled HRPD ConnectionRequest and RouteUpdate messages }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has performed pre-registration on HRPD neighbour cell }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message containing tunnelled HRPD TrafficChannelAssignment, HRPDSilenceParameters and HRPDOpenLoopParameters messages }
  then { UE transmits a TrafficChannelComplete message on the target HRPD cell }
}
```

8.4.5.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.4.3.3, 5.4.4.3, 5.4.5.1 and 5.4.5.3, TS 23.402, clause 9.3.2 and 3GPP2 X.S0057- B v1.0, clause 13.1.2.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - ...
 - 2> else if the *targetRAT-Type* is set to 'cdma2000-1XRTT' or 'cdma2000-HRPD':
 - 3> forward the *targetRAT-Type* and the *targetRAT-MessageContainer* to the CDMA2000 upper layers for the UE to access the cell indicated in the inter-RAT message in accordance with the specifications of the CDMA2000 target-RAT;

[TS 36.331, clause 5.4.4.3]

Upon reception of the *HandoverFromEUTRAPreparationRequest* message, the UE shall:

- 1> indicate the request to prepare handover and forward the *cdma2000-Type* to the CDMA2000 upper layers;
- 1> if *cdma2000-Type* is set to 'type1XRTT':
 - 2> forward the *rand* and the *mobilityParametersCDMA2000* to the CDMA2000 upper layers;

[TS 36.331, clause 5.4.5.1]



Figure 5.4.5.1-1: UL handover preparation transfer

The purpose of this procedure is to tunnel the handover related CDMA2000 dedicated information from UE to E-UTRAN when requested by the higher layers. The procedure is triggered by the higher layers on receipt of *HandoverFromEUTRAPreparationRequest* message. This procedure applies to CDMA2000 capable UEs only.

[TS 36.331, clause 5.4.5.3]

The UE shall set the contents of the *ULHandoverPreparationTransfer* message as follows:

- 1> include the *cdma2000-Type* and the *dedicatedInfoCDMA2000*;
- 1> if the *cdma2000-Type* is set to 'type1XRTT':
 - 2> include the *meid* and set it to the value received from the CDMA 2000 upper layers;
- 1> submit the *ULHandoverPreparationTransfer* message to lower layers for transmission, upon which the procedure ends;

[TS 23.402, clause 9.3.2]

Figure 9.3.2-1 illustrates a high-level call flow for the optimised E-UTRAN to HRPD handover procedure, Handover phase. The prerequisite of the handover phase is the successfully performed Pre-registration phase as it is specified in clause 9.3.1.

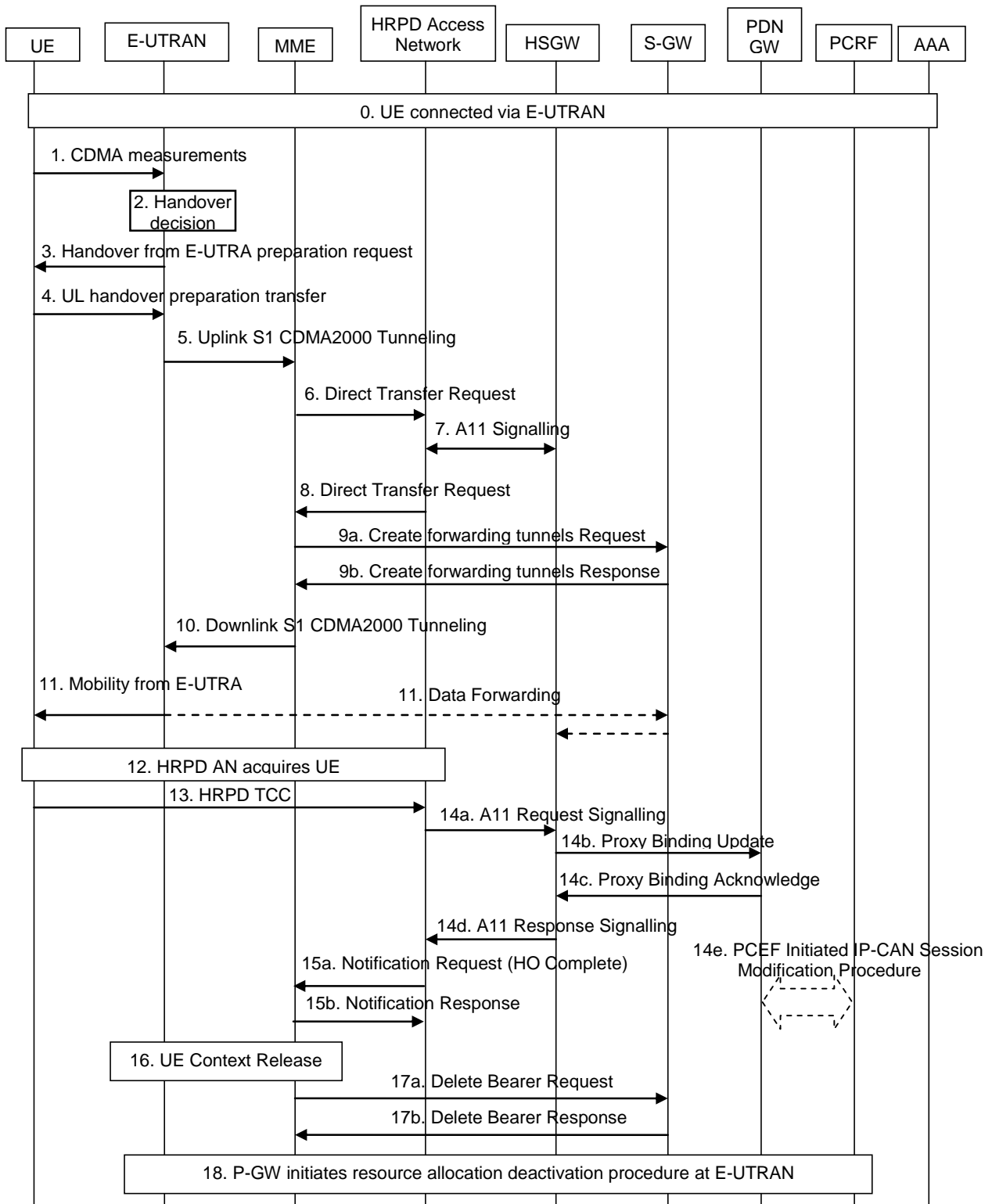


Figure 9.3.2-1: E-UTRAN to HRPD handover

[3GPP2 X.S0057- B v1.0, clause 13.1.2]

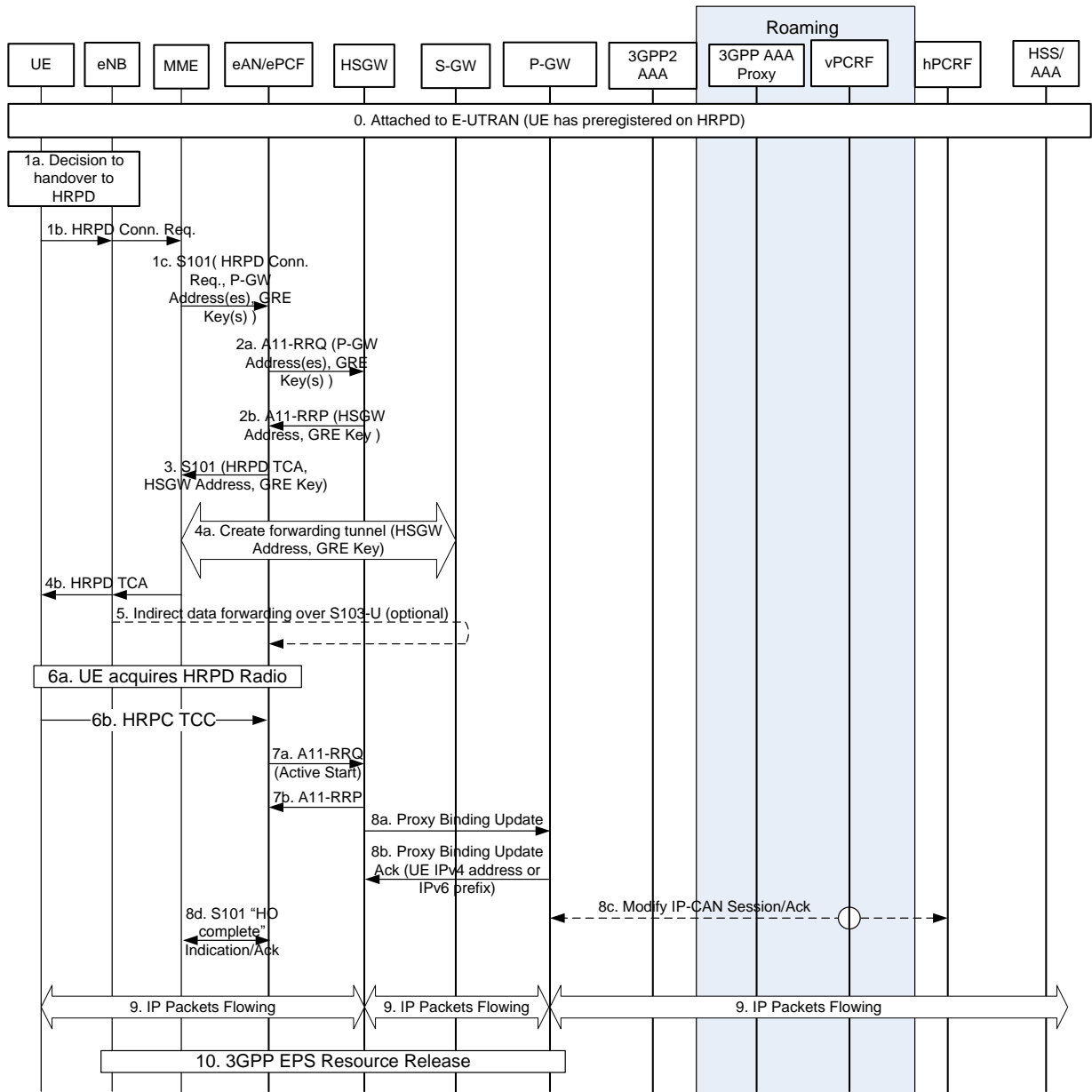


Figure 9.3.2-2

8.4.5.4.3 Test description

8.4.5.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 15.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3B) on Cell 1 according to [18].
- The UE has performed HRPD pre-registration on Cell 15.

8.4.5.4.3.2 Test procedure sequence

Table 8.4.5.4.3.2-1 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, while row 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 8.4.5.4.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 15 | Remark |
|---|-----------------------|--------------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -75 | - | The power level values are such that camping on Cell 1 is guaranteed. |
| | lor/loc | dB | - | -20 | |
| | loc | dBm/1.23 MHz | - | -55 | |
| | Pilot Ec/lo (Note 1) | dB | - | -20 | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | The power level values are such that entering conditions for event B2 on Cell 15 are satisfied. |
| | lor/loc | dB | - | -5 | |
| | loc | dBm/1.23 MHz | - | -55 | |
| | Pilot Ec/lo (Note 1) | dB | - | -6 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.5.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 1 to setup inter RAT measurement on Cell 15. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 15 parameters according to row "T1" in table 8.4.5.4.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 for Cell 15. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits a <i>HandoverFromEUTRAPreparationRequest</i> on Cell 1. | <-- | <i>HandoverFromEUTRAPreparationRequest</i> | - | - |
| 6 | Check: Does the UE transmit tunnelled HRPD <i>Connection Request</i> and <i>Route Update</i> messages contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 1 | P |
| 7 | The SS transmits tunnelled HRPD <i>Traffic Channel Assignment</i> , <i>HRPD Silence Parameters</i> and <i>HRPD Open Loop Parameters</i> messages contained in a <i>MobilityFromEUTRACommand</i> on Cell1 to order the UE to perform inter RAT handover to Cell 15. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 8 | The UE tunes to HRPD radio. | - | - | - | - |
| 9 | Check: Does the UE transmit a <i>Traffic Channel Complete</i> message on Cell 15? | --> | <i>Traffic Channel Complete</i> | 2 | P |

8.4.5.4.3.3 Specific message contents

Table 8.4.5.4.3.3-1: RRCConnectionReconfiguration (step 1, Table 8.4.5.4.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition MEAS

Table 8.4.5.4.3.3-2: MeasConfig (step 1, Table 8.4.5.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f14 | | |
| measObject[2] | MeasObjectCDMA2000-GENERIC | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT-B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f14 | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotStrength | | |
| } | | | |
| } | | | |
| measGapConfig CHOICE { | | | |
| setup SEQUENCE { | | | |
| gapOffset CHOICE { | | | |
| gp1 | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.5.4.3.3-3: *MeasObjectCDMA2000-GENERIC* (step 1, Table 8.4.5.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------------------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | TypeHRPD | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f14 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE { | Cell 15 | Listed cell parameters to be reported | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.5.4.3.3-4: *MeasurementReport* (step 4, Table 8.4.5.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | TRUE | | |
| measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | Note 1 | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.5.4.3.3-5: HandoverFromEUTRAPreparationRequest (step 5, Table 8.4.5.4.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | typeHRPD | | |
| rand | Not present | | |
| mobilityParameters | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.5.4.3.3-6: ULHandoverPreparationTransfer (step 6, Table 8.4.5.4.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | typeHRPD | | |
| meid | Not present | | |
| dedicatedInfo | Set according to Table 8.4.5.4.3.3-6A | HRPD Connection Request and Route Update | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.5.4.3.3-6A: *dedicatedInfo* in *ULHandoverPreparationTransfer* (step 6, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------------|--|---|-----------|
| SAPState | '0'B | SAP Header | |
| SessionConfigurationToken | 16 bits, Set by UE | | |
| ConnectionLayerFormat | 1 bit, Set by UE | | |
| ATI Record | 34 bits, Set based on UATI assigned to UE | | |
| Reserved | '0000'B | | |
| Length | Length of <i>HRPD Route Update</i> message (Table 8.4.5.4.3.3-7A) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS | Connection Layer Header | |
| StreamHeader | '00'B | Stream Layer header. Stream 0 is assigned to the Default Signalling Application | |
| SLPHeader | Set by the UE | Signalling Link Protocol SLP-D and SLP-F headers. | |
| SNPHeader | '00001110' | Signalling Network Protocol header. InConfigurationProtocol=0, Type=Route Update. | |
| SessionLayerPacket | <i>HRPD Route Update</i> message (Table 8.4.5.4.3.3-7A) | | |
| Length | Length of <i>HRPD Connection Request</i> message (Table 8.4.5.4.3.3-7) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS | Connection Layer Header | |
| StreamHeader | '00'B | Stream Layer header. Stream 0 is assigned to the Default Signalling Application | |
| SLPHeader | Set by the UE | Signalling Link Protocol SLP-D and SLP-F headers. | |
| SNPHeader | '00001100' | Signalling Network Protocol header. InConfigurationProtocol=0, Type=Idle State. | |
| SessionLayerPacket | <i>HRPD Connection Request</i> message (Table 8.4.5.4.3.3-7) | | |

Table 8.4.5.4.3.3-7: HRPD Connection Request (step 6, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|-------------------|---------------------------|--------------------------------------|
| MessageID | '0000001' | Connection Request | this value shall be verified by TTCN |
| TransactionID | Any allowed value | 8 bit field | |
| RequestReason | '0000' | Access Terminal Initiated | |

Table 8.4.5.4.3.3-7A: HRPD Route Update (step 6, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-------------------------------|----------------------------|--------------|--------------------------------------|
| MessageID | '0000000'B | Route Update | this value shall be verified by TTCN |
| MessageSequence | 8 bits, Set by UE | | |
| ReferencePilotPN | 9 bits, Set by UE | | |
| ReferencePilotStrength | 6 bits, Set by UE | | |
| ReferenceKeep | '1'B | | |
| NumPilots | '0000'B | | |
| CompatibleReserved | '0'B | | |
| ReferencePilotChannelIncluded | '1'B | | |
| ReferencePilotChannel | 24 bits, Set by UE | | |
| ReferencePilotArrivalIncluded | '1'B | | |
| ReferencePilotArrival | 15 bits, Set by UE | | |
| Reserved | 0-7 bits, Set all 0s by UE | | |

Table 8.4.5.4.3.3-8: MobilityFromEUTRACommand (step 7, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---|--|--|-----------|
| Derivation Path: 36.508, Table 4.6.1-6 | | | |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r8 SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE{ | | | |
| handover SEQUENCE { | | | |
| targetRAT-Type | cdma2000-HRPD | | |
| targetRAT-MessageContainer | Set according to Table 8.4.5.4.3.3-8 A | HRPD Silence Parameters and HRPD Open Loop Parameters, HRPD Traffic Channel Assignment | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.5.4.3.3-8A: *targetRAT-MessageContainer* in *MobilityFromEUTRACommand* (step 7, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------------|---|--|-----------|
| SAPState | '1'B | SAP Header | |
| SessionConfigurationToken | '0'B | | |
| ConnectionLayerFormat | 1 bit, Set by SS | | |
| ATI Record | 34 bits, Set based on UATI assigned to UE | | |
| Reserved | '0000'B | | |
| Length | Length of <i>HRPD Silence Parameters</i> message (Table 8.4.5.4.3.3-9A) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS | Connection Layer Header (Note 1) | |
| StreamHeader | '00'B | Stream Layer header. Stream 0 is assigned to the Default Signalling Application | |
| SLPHeader | Set by the SS | Signalling Link Protocol SLP-D and SLP-F headers. | |
| SNPHeader | '00001111' | Signalling Network Protocol header. InConfigurationProtocol=0, Type=Overhead Messages. | |
| SessionLayerPacket | <i>HRPD Silence Parameters</i> message (Table 8.4.5.4.3.3-9A) | (Note 1) | |
| Length | Length of <i>HRPD Open Loop Parameters</i> message (Table 8.4.5.4.3.3-9B) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS | Connection Layer Header (Note 1) | |
| StreamHeader | '00'B | Stream Layer header. Stream 0 is assigned to the Default Signalling Application | |
| SLPHeader | Set by the SS | Signalling Link Protocol SLP-D and SLP-F headers. | |
| SNPHeader | '00000100' | Signalling Network Protocol header. InConfigurationProtocol=0, Type=Reverse Traffic Channel MAC. | |
| SessionLayerPacket | <i>HRPD Open Loop Parameters</i> message (Table 8.4.5.4.3.3-9B) | (Note 1) | |
| Length | Length of <i>HRPD Traffic Channel Assignment</i> message (Table 8.4.5.4.3.3-9) + length of StreamHeader + length of SLPHeader + length | Connection Layer Header | |

| | | | |
|--------------------|--|---|--|
| | of SNPHeader below, Set by SS | | |
| StreamHeader | '00'B | Stream Layer header. Stream 0 is assigned to the Default Signalling Application | |
| SLPHeader | Set by the SS | Signalling Link Protocol SLP-D and SLP-F headers. | |
| SNPHeader | '00001110' | Signalling Network Protocol header. InConfigurationProtocol=0, Type=Route Update. | |
| SessionLayerPacket | <i>HRPD Traffic Channel Assignment</i> message (Table 8.4.5.4.3.3-9) | | |

Note 1: *HRPD Silence Parameters* message and *HRPD Open Loop Parameters* message can be sent in any order.

Table 8.4.5.4.3.3-9: HRPD Traffic Channel Assignment (step 7, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|------------------------------|---|-----------|
| MessageID | '00000001'B | Traffic Channel Assignment | |
| MessageSequence | Set by SS | 8 bit field | |
| ChannelIncluded | '1'B | Channel record included | |
| Channel | '0000000000000000001111010'B | channel record for Cell 15 | |
| FrameOffset | '1010'B | frame offset for Cell 15 | |
| DRCLength | '01'B | DRCLength for Cell 15 | |
| DRCChannelGainBase | '111101'B | ratio of the power level of the DRC Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB | |
| ACKChannelGain | '000110'B | ratio of the power level of the Ack Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB | |
| NumPilots | '1'B | | |
| PilotPN | '000110010'B | PN Offset of target sector (Cell 15) | |
| SofterHandoff | '0'B | Set to '0' since only 1 pilot included in message | |
| MACIndexLSBs | Set by SS | 6 least significant bits of the MACIndex assigned to UE | |
| DRCCover | '001'B | index of the DRC cover associated with target sector (Cell 15) | |
| RABLength | '01'B | 2 bit field | |
| RABOffset | '010'B | 3 bit field | |

Table 8.4.5.4.3.3-9A: HRPD Silence Parameters (step 7, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|----------------------------|----------------------------|---------|-----------|
| MessageID | '00000010'B | | |
| ReverseLinkSilenceDuration | 2 bits, Set by SS | | |
| ReverseLinkSilencePeriod | 2 bits, Set by SS | | |
| Reserved | 0-7 bits, Set all 0s by SS | | |

Table 8.4.5.4.3.3-9B: HRPD Open Loop Parameters (step 7, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|----------------------------|----------------------------|---------|-----------|
| MessageID | '0000111'B | | |
| NumPilots | '0001'B | | |
| PilotPN | 9 bits, Set by SS | | |
| OpenLoopAdjust | 8 bits, Set by SS | | |
| InitialAdjust | 5 bits, Set by SS | | |
| PilotStrengthIncluded | 1 bit, Set by SS | | |
| PilotStrengthNominal | 3 bits, Set by SS | | |
| PilotStrengthCorrectionMin | 3 bits, Set by SS | | |
| PilotStrengthCorrectionMax | 3 bits, Set by SS | | |
| Reserved | 0-7 bits, Set all 0s by SS | | |

Table 8.4.5.4.3.3-10: HRPD Traffic Channel Complete (step 9, Table 8.4.5.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|--|---------|--------------------------------------|
| MessageID | '00000010' | | this value shall be verified by TTCN |
| MessageSequence | Same value as MessageSequence in HRPD Traffic Channel Assignment message (Table 8.4.5.4.3.3-9) | | |

8.4.6 Inter-RAT handover HRPD to E-UTRA

8.4.7 Inter-RAT mobility E-UTRA to 1xRTT

8.4.7.1 Inter-RAT handover / SRVCC from E-UTRA to 1xRTT(CS) / Speech

8.4.7.1.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a HandoverFromEUTRAPreparationRequest message with cdma2000-type set to 'type1xRTT' }
  then { UE transmits an ULHandoverPreparationTransfer message containing a tunnelled 1xRTT Origination message }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message containing a tunnelled 1xRTT Handoff Direction message }
  then { UE transmits a 1xRTT Handoff Completion message on the target 1xRTT cell }
}
```

8.4.7.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.4.3.3, 5.4.4.3, 5.4.5.1 and 5.4.5.3, TS 23.216, clause 6.1.3 and 3GPP2 X.S0042-A v1.0, clause 4.5.1.

[TS 36.331, clause 5.4.3.3]

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to 'handover':
 - 2> if the *targetRAT-Type* is set to 'utra' or 'geran':
 - ...
 - 2> else if the *targetRAT-Type* is set to 'cdma2000-1XRTT' or 'cdma2000-HRPD':
 - 3> forward the *targetRAT-Type* and the *targetRAT-MessageContainer* to the CDMA2000 upper layers for the UE to access the cell indicated in the inter-RAT message in accordance with the specifications of the CDMA2000 target-RAT;

[TS 36.331, clause 5.4.4.3]

Upon reception of the *HandoverFromEUTRAPreparationRequest* message, the UE shall:

- 1> indicate the request to prepare handover and forward the *cdma2000-Type* to the CDMA2000 upper layers;
- 1> if *cdma2000-Type* is set to 'type1XRTT':
 - 2> forward the *rand* and the *mobilityParametersCDMA2000* to the CDMA2000 upper layers;

[TS 36.331, clause 5.4.5.1]



Figure 5.4.5.1-1: UL handover preparation transfer

The purpose of this procedure is to tunnel the handover related CDMA2000 dedicated information from UE to E-UTRAN when requested by the higher layers. The procedure is triggered by the higher layers on receipt of *HandoverFromEUTRAPreparationRequest* message. This procedure applies to CDMA2000 capable UEs only.

[TS 36.331, clause 5.4.5.3]

The UE shall set the contents of the *ULHandoverPreparationTransfer* message as follows:

- 1> include the *cdma2000-Type* and the *dedicatedInfoCDMA2000*;
- 1> if the *cdma2000-Type* is set to 'type1XRTT':
 - 2> include the *meid* and set it to the value received from the CDMA2000 upper layers;
- 1> submit the *ULHandoverPreparationTransfer* message to lower layers for transmission, upon which the procedure ends;

[TS 23.216, clause 6.1.3]

Figure 6.1.3-1 illustrates a high-level call flow for the E-UTRAN-to-1x voice service continuity procedure.

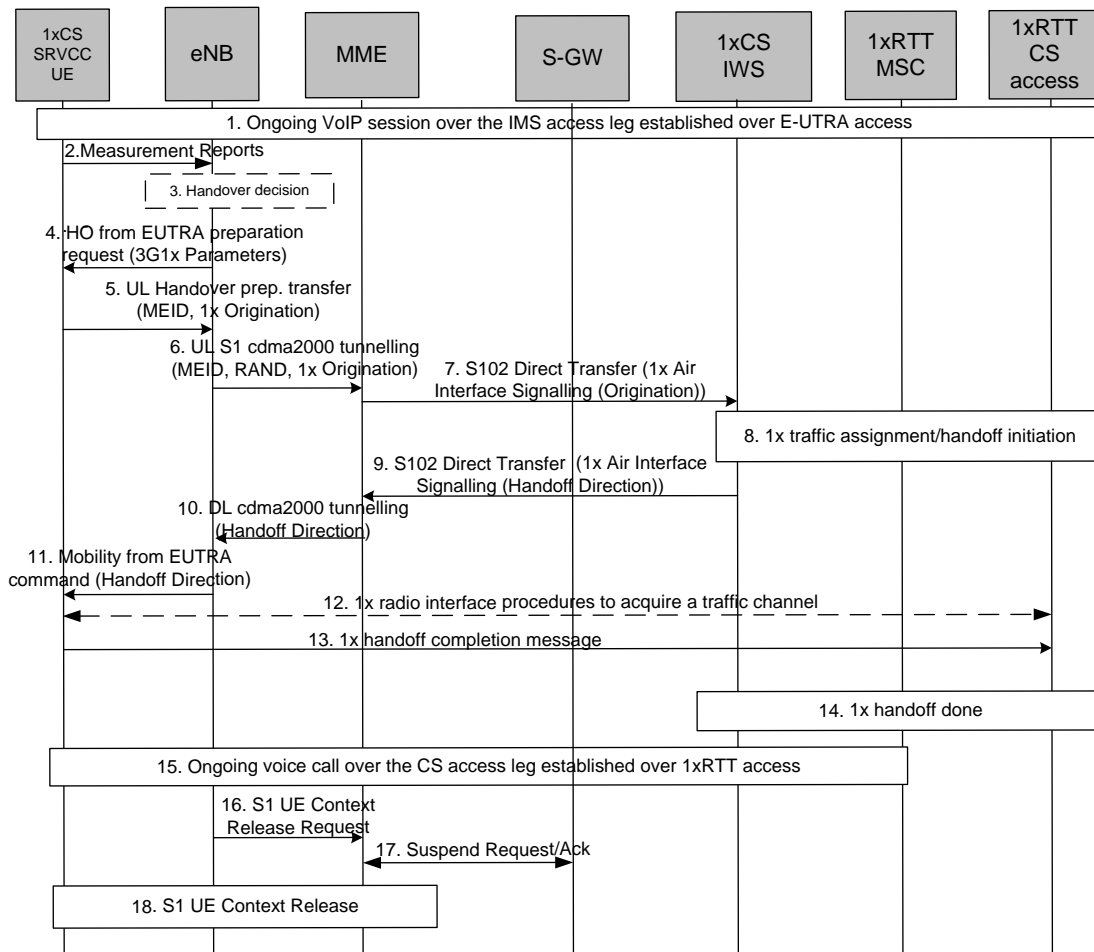


Figure 6.1.3-1: LTE VoIP-to-1x CS voice service continuity

1. Ongoing VoIP session over the IMS access leg established over EPS/E-UTRAN access.
2. 1xCS SRVCC UE sends measurement reports to eNodeB.
3. The E-UTRAN (e.g., based on some trigger, measurement reports) makes a determination to initiate an inter-technology handover to cdma2000 1xRTT.
4. The E-UTRAN signals the UE to perform an inter-technology handover by sending a Handover from EUTRA Preparation Request (3G1x Overhead Parameters, RAND value) message.
5. The UE initiates signalling for establishment of the CS access leg by sending a UL handover preparation message containing the 1xRTT Origination message.
6. The E-UTRAN sends an Uplink S1 cdma2000 Tunnelling (MEID, RAND, 1x Origination, Reference CellID) message to the MME. The eNodeB will also include CDMA2000 HO Required Indication IE to Uplink S1 CDMA2000 Tunnelling message, which indicates to the MME that the handover preparation has started.
7. Upon reception of the Uplink S1 cdma2000 Tunnelling message, the MME selects a 3GPP2 1xCS IWS based on Reference CellID and encapsulates the 1x Origination Message along with the MEID and RAND in a S102 Direct Transfer message (as "1x Air Interface Signalling").
8. The traffic channel resources are established in the 1x RTT system and 3GPP2 1xCS procedures for initiation of Session Transfer are performed as per 3GPP2 X.S0042-A v1.0 [4].

NOTE 1: Step 9 and 3GPP2 1xCS procedures in step 8 are independent of each other.

NOTE 2: The "VDN" parameter referred to in 3GPP2 X.S0042-A v1.0 [4] corresponds to the STN-SR parameter defined in TS 23.237 [14].

9. The 3GPP2 1xCS IWS creates a 1x message and encapsulates it in a S102 Direct Transfer message (1x, Handover indication). If the 3GPP2 access was able to allocate resources successfully, the 1x message is a 1x Handover Direction message and the handover indicator indicates successful resource allocation. Otherwise, the handover indicator indicates to the MME that handover preparation failed and the embedded 1x message indicates the failure to the UE.
10. The MME sends the 1x message and CDMA2000 HO Status IE in a Downlink S1 cdma2000 Tunnelling message to the E-UTRAN. The CDMA2000 HO Status IE is set according to the handover indicator received over the S102 tunnel.
11. If the CDMA2000 HO Status IE indicates successful handover preparation, the E-UTRAN forwards the 1x Handoff Direction message embedded in a Mobility from EUTRA Command message to the UE. This is perceived by the UE as a Handover Command message. If handover preparation failed, DL Information transfer message will be sent instead, with the embedded 1xRTT message that indicates the failure to the UE.
12. Once the UE receives the traffic channel information from the cdma2000 1xRTT system, the UE retunes to the 1xRTT radio access network and performs traffic channel acquisition with the 1xRTT CS access (e.g., 1xRTT BSS).
13. The UE sends a 1xRTT handoff completion message to the 1xRTT CS access (e.g., 1xRTT BSS).
14. The 1xRTT CS Access sends message to 1xRTT MSC to indicate of handoff done. The resources between 1x CS IWS and 1xRTT MSC may be released at this step.
15. Ongoing voice call over the CS access leg established over 1xRTT access. The E-UTRAN/EPS context may be released based on the normal E-UTRAN/EPS procedure.
16. The eNodeB sends an S1 UE Context Release Request (Cause) message to the MME. Cause indicates the S1 release procedure is caused by handover from E-UTRAN to 1xRTT.
17. The MME exchanges Suspend Request/ Acknowledge messages with the Serving GW. The S1-U bearers are released for all EPS bearers and the GBR bearers are deactivated by the MME. The non-GBR bearers are preserved and are marked as suspended in the S-GW. Upon receipt of downlink data the S-GW should not send a downlink data notification message to the MME.
18. S1 UE Context in the eNodeB is released as specified in TS 23.401 [2].

[3GPP2 X.S0042-A v1.0, clause 4.5.1]

Figure 16 illustrates a detailed call flow for the single radio VoIP-to-1x CS voice DT procedure.

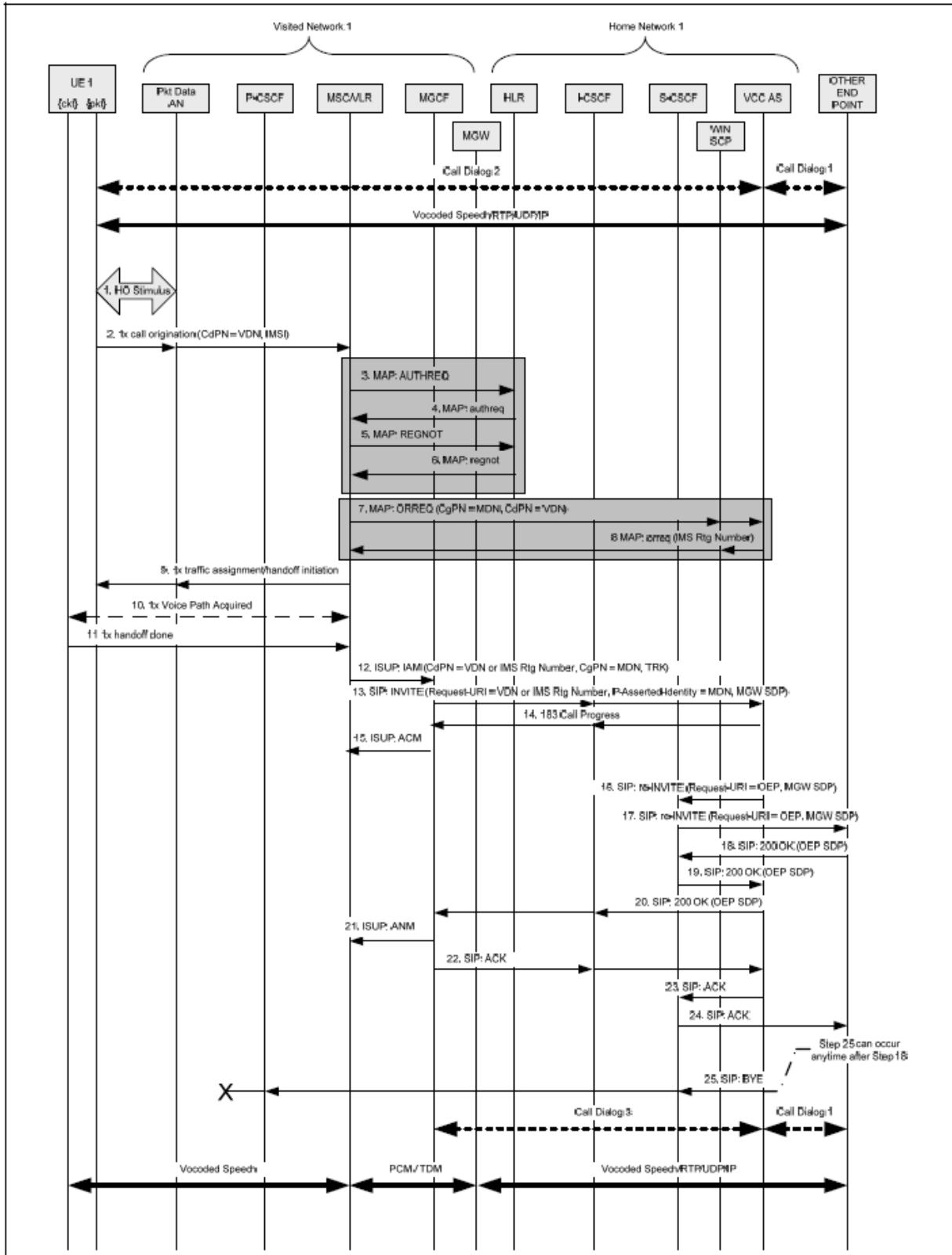


Figure 16 Single Radio VoIP-to-1x CS voice DT

Pre-condition:

It is assumed that initially there is an IMS VoIP call setup between a single radio, dual mode UE 1 and the Other End Point (OEP). SIP call dialog 1 for this voice call is illustrated by a heavy dashed double arrow between the VCC AS and

the OEP. SIP call dialog 2 for this voice call is illustrated by a heavy dashed double arrow between the VCC AS and UE 1. The voice bearer path is illustrated by a heavy solid double arrow between UE 1 and the OEP.

1. UE 1 and the packet data AN interact to initiate a DT. See [A.S0008-C v4.0] and [A.S0009-C v4.0] or [SRVCC] for signalling details.
2. UE 1 sends a 1x call origination to the MSC/VLR via the packet data AN (and optionally, the 1x BS) and includes the VDN. The specific messages and any acknowledgements are not shown for brevity. See [A.S0008-C v4.0] and [A.S0009-C v4.0] or [SRVCC] for signalling details.

NOTE 1: steps 3-6 are optional, depending on whether the UE 1 has previously been 1xCS registered and authenticated.

3. The Visited MSC/VLR may initiate a 1x registration procedure on behalf of UE 1. The Visited MSC sends a MAP AUTHREQ message to UE 1's HLR to authenticate UE 1 prior to allowing registration and prior to allocating a 1x traffic channel to UE 1.
4. UE 1's HLR responds by sending an MAP authreq message to the Visited MSC.
5. The Visited MSC sends an MAP REGNOT message to UE 1's HLR.
6. UE 1's HLR responds by sending an MAP REGNOT message to the Visited MSC.

NOTE 2: Steps 7-8 are shown using the MAP ORREQ operation. Optionally, a post digit analysis trigger using the MAP ANALYZD operation may be used instead to obtain routing information for the DT.

NOTE 3: If either origination triggers are not supported by the MSC/VLR or origination triggers are not armed for this subscriber, proceed to Step 9.

7. Once the visited MSC/VLR has obtained the service profile for the originating subscriber (i.e., by Step 4), the Visited MSC/VLR invokes a call origination trigger to obtain routing information. The Visited MSC/VLR sends a MAP RREQ message to the WIN SCP (or to the HLR), containing the Calling Party Number (MDN) of UE 1 (derived from the IMSI) and the Called Party Number from the call origination. The WIN SCP (or HLR) sends the ORREQ message on to the VCC AS. Optionally, the Visited MSC/VLR may send the ORREQ message directly to a VCC AS that has an integrated WIN SCP function.
8. The VCC AS determines that this is a DT scenario based on the VDN in the Called Party Number (and the Calling Party Number) in the ORREQ message, and then allocates an IMS Routing Number, which is an E.164 temporary routing number associated with this DT. The VCC AS then sends back the MAP ORREQ message to WIN SCP (or HLR), which returns the ORREQ message to the MSC/VLR. Optionally, the VCC AS has an integrated WIN SCP function and sends the ORREQ message directly to the MSC/VLR.
9. Anytime after Step 2 the MSC/VLR sends a 1x traffic assignment/handoff initiation to UE 1 via the packet data AN and the packet data air interface. This instructs UE 1 to perform the handoff and acquire the 1x traffic channel. See [A.S0008-C v4.0] and [A.S0009-C v4.0] or [SRVCC] for signalling details.
10. The 1x BS acquires UE 1's reverse traffic channel and the voice path is established with the MSC.

8.4.7.1.3 Test description

8.4.7.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 19.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.4.7.1.3.2 Test procedure sequence

Table 8.4.7.1.3.2-1 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, while row 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 8.4.7.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|-----------------------|--------------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -75 | - | Cell 19 is off. |
| | lor/loc | dB | - | - | |
| | Pilot Ec/lor | dB | - | - | |
| | loc | dBm/1.23 MHz | - | - | |
| | Pilot Ec/lo (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -75 | - | The power level values are such that entering conditions for event B2 on Cell 19 are satisfied. |
| | lor/loc | dB | - | 0 | |
| | Pilot Ec/lor | dB | - | -7 | |
| | loc | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/lo (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 1 to setup inter RAT measurement on Cell 19. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 19 parameters according to row "T1" in table 8.4.7.1.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 for Cell 19. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits a <i>HandoverFromEUTRAPreparationRequest</i> on Cell 1. | <-- | <i>HandoverFromEUTRAPreparationRequest</i> | - | - |
| 6 | Check: Does the UE transmit a tunnelled <i>1xRTT GCSNA Encapsulated Origination</i> message contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 1 | P |
| 7 | The SS transmits a tunnelled <i>1xRT GCSNA Encapsulated T Handoff Direction</i> message contained in a <i>MobilityFromEUTRACommand</i> on Cell1 to order the UE to perform inter RAT handover to Cell 19. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 8 | The UE tunes to 1xRTT radio. | - | - | - | - |
| 9 | Check: Does the UE transmit a <i>1xRTT Handoff Completion</i> message on Cell 19? | --> | <i>Handoff Completion</i> | 2 | P |

8.4.7.1.3.3 Specific message contents

Table 8.4.7.1.3.3-1: RRCConnectionReconfiguration (step 1, Table 8.4.7.1.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition MEAS

Table 8.4.7.1.3.3-2: MeasConfig (step 1, Table 8.4.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f17 | | |
| measObject[2] | MeasObjectCDMA2000-GENERIC | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT-B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigEUTRA | Not present | | |
| quantityConfigUTRA | Not present | | |
| quantityConfigGERAN | Not present | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotPnPhaseAndpilotStrength | | |
| } | | | |
| } | | | |
| measGapConfig CHOICE { | | | |
| setup SEQUENCE { | | | |
| gapOffset CHOICE { | | | |
| gp1 | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.1.3.3-3: *MeasObjectCDMA2000-GENERIC* (step 1, Table 8.4.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f17 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE {} | Cell 19 | | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.7.1.3.3-4: *MeasurementReport* (step 4, Table 8.4.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | FALSE | | |
| measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 19 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotPnPhase | (0..32767) | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.1.3.3-5: HandoverFromEUTRAPreparationRequest (step 5, Table 8.4.7.1.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XR TT | | |
| Rand | Set by SS | Random Challenge Data as broadcast on Cell 19 | |
| mobilityParameters | Set according to 36.508 Table 4.5.2C.4-6 | CDMA2000Parameters | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.3.3.3-6: Void**Table 8.4.7.1.3.3-7: ULHandoverPreparationTransfer (step 6, Table 8.4.7.1.3.2-2)**

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|--------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XR TT | | |
| Meid | UE's meid | | |
| dedicatedInfo | Set according to Table 8.4.7.1.3.3-8 | 1xRTT GCSNA Encapsulated Origination message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.1.3.3-8: 1xRTT Origination (step 6, Table 8.4.7.1.3.2-2)

| Field | Value/remark | Comment | Condition |
|-------------------------------------|--|---|-----------|
| MessageID | '00000001'B | GCSNA 1xCircuitService message | |
| GCSNAOption | '00001000'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | 6 bits, Set by UE | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000100'B | Origination message | |
| NumTLACHeaderRecords | '0001'B | | |
| TLACHeaderRecordType | '0000'B | | |
| TLACHeaderRecordLength | 4 bits, Set by UE | | |
| MSID_TYPE | 3 bits, Set by UE | Should be matched with PREF_MSID_TYP E | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| Reserved | '0000000'B | | |
| 1xL3PDULength | 16 bits, Set by UE | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHARi | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH Capability Type-specific fields | Variable | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.1.3.3-9: MobilityFromEUTRACommand (step 7, Table 8.4.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-6 | | | |
|---|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r8 SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE{ | | | |
| handover SEQUENCE { | | | |
| targetRAT-Type | cdma2000-1XRTT | | |
| targetRAT-MessageContainer | Set according to Table 8.4.7.1.3.3-10 | 1xRTT GCSNA Encapsulated Handoff Direction message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.1.3.3-10: 1xRTT GCSNA Encapsulated Handoff Direction (step 7, Table 8.4.7.1.3.2-2)

| Field | Value/remark | Comment | Condition |
|-----------------------------|--------------------|--|-----------|
| MessageID | '00000001'B | GCSNA 1xCircuitService message | |
| GCSNAOption | '00001000'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '1'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00100010'B | Universal Handoff Direction message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| HDM_SEQ | 2 bits, Set by SS | | |
| PARMS_INCL | '1'B | | |
| P_REV | '00000110'B | | |
| SERV_NEG_TYPE | '1'B | | |
| SEARCH_INCLUDED | '1'B | | |
| SRCH_WIN_A | '1000'B | | |
| SRCH_WIN_N | '1001'B | | |
| SRCH_WIN_R | '1011'B | | |
| T_ADD | '010100'B | | |
| T_DROP | '011110'B | | |
| T_COMP | '1010'B | | |
| T_TDROP | '0100'B | | |
| SOFT_SLOPE | '000000'B | | |
| ADD_INTERCEPT | '000000'B | | |
| DROP_INTERCEPT | '000000'B | | |
| EXTRA_PARMS | '1'B | | |
| PACKET_ZONE_ID | '00000000'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| PRIVATE_LCM | '0'B | | |
| RESET_L2 | '1'B | | |
| RESET_FPC | '1'B | | |
| ENCRYPT_MODE | '00'B | | |
| NOM_PWR_EXT | '0'B | | |
| NOM_PWR | '0000'B | | |
| RLGAIN_TRAFFIC_PILOT | '000000'B | | |
| DEFAULT_RLAG | '1'B | | |
| NUM_PREAMBLE | '000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| RETURN_IF_HANDOFF_FAIL | '0'B | | |
| PERIODIC_SEARCH | '0'B | | |
| SCR_INCLUDED | '1'B | | |
| NNSCR_INCLUDED | '1'B | | |
| USE_PWR_CNTL_STEP | '0'B | | |
| CLEAR_RETRY_DELAY | '0'B | | |
| SCH_INCL | '1'B | | |
| FPC_SUBCHAN_GAIN | '01010'B | | |
| USE_PC_TIME | '0'B | | |
| CH_IND | '101'B | | |
| ACTIVE_SET_REC_LEN | 8 bits, Set by SS | | |
| NUM_PILOTS | '001'B | | |
| SRCH_OFFSET_INCL | '1'B | | |
| PILOT_PN | '000000000'B | | |

| | | | |
|---------------------|--------------------|--|--|
| SRCH_OFFSET | '010'B | | |
| ADD_PILOT_REC_INCL | '0'B | | |
| PWR_COMB_IND | '0'B | | |
| CODE_CHAN_FCH | 11 bits, Set by SS | | |
| QOF_MASK_ID_FCH | '00'B | | |
| RESERVED | 0-7 bits | | |
| REV_FCH_GATING_MODE | '0'B | | |

Table 8.4.7.1.3.3-11: 1xRTT Handoff Completion (step 9, Table 8.4.7.1.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|--|---------|-----------|
| MSG_ID | '00001010' | | |
| ACK_SEQ | 3 bits | | |
| MSG_SEQ | 3 bits | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| LAST_HDM_SEQ | Same value as HDM_SEQ in 1xRTT Handoff Direction message at Step 7 | | |
| PILOT_PN | Same value as PILOT_PN included in 1xRTT Handoff Direction message at Step 7 | | |

8.4.7.2 Void

8.4.7.3 Pre-registration at 1xRTT and inter-RAT Redirection / CS fallback from E-UTRA RRC_IDLE to 1xRTT / MT call

8.4.7.3.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state having completed the 1xRTT CS pre-registration procedure and
having received a DLInformationTransfer message containing a 1xRTT CS Paging message }
ensure that {
  when { CS paging for the CS Fallback to 1xRTT is accepted at the UE }
  then { UE transmits an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST
message with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" }
}
```

(2)

```
with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST
message with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" in response to
a 1xRTT CS Paging message }
ensure that {
  when { SS transmits an RRCConnectionRelease message with redirection to 1xRTT }
  then { UE tunes to 1xRTT cell and transmits a 1xRTT Page Response message on 1xRTT cell }
}
```

8.4.7.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3.

[TS 23.272, clause B.2.3]

This clause describes the mobile terminating call procedures when the UE accepts or rejects CS paging for the CS Fallback to 1xRTT.

When the 1xMSC receives a registration from a UE, it makes note of the RAN equipment from which it received the registration. Subsequent paging activities may thus be directed toward that RAN equipment. However, paging activities by the 1xMSC are not limited to the single RAN equipment from which the registration was received. The MSC may choose to page a wider area, including inter-system paging. If the 1xMSC has direct interfaces to 1xCS IWS, as well as

to 1xRTT access, the MSC may choose to do direct paging activities to both E-UTRAN and 1x RAN equipments in its attempts to contact the UE.

The 1x paging request sent by the 1xMSC to the 1xCS IWS is delivered to the UE via the tunnel. The UE tunes to 1xRTT access, acknowledges the 1x page and performs the 1xCS procedures for mobile terminated call.

The detailed procedure is described in figure B.2.3-1.

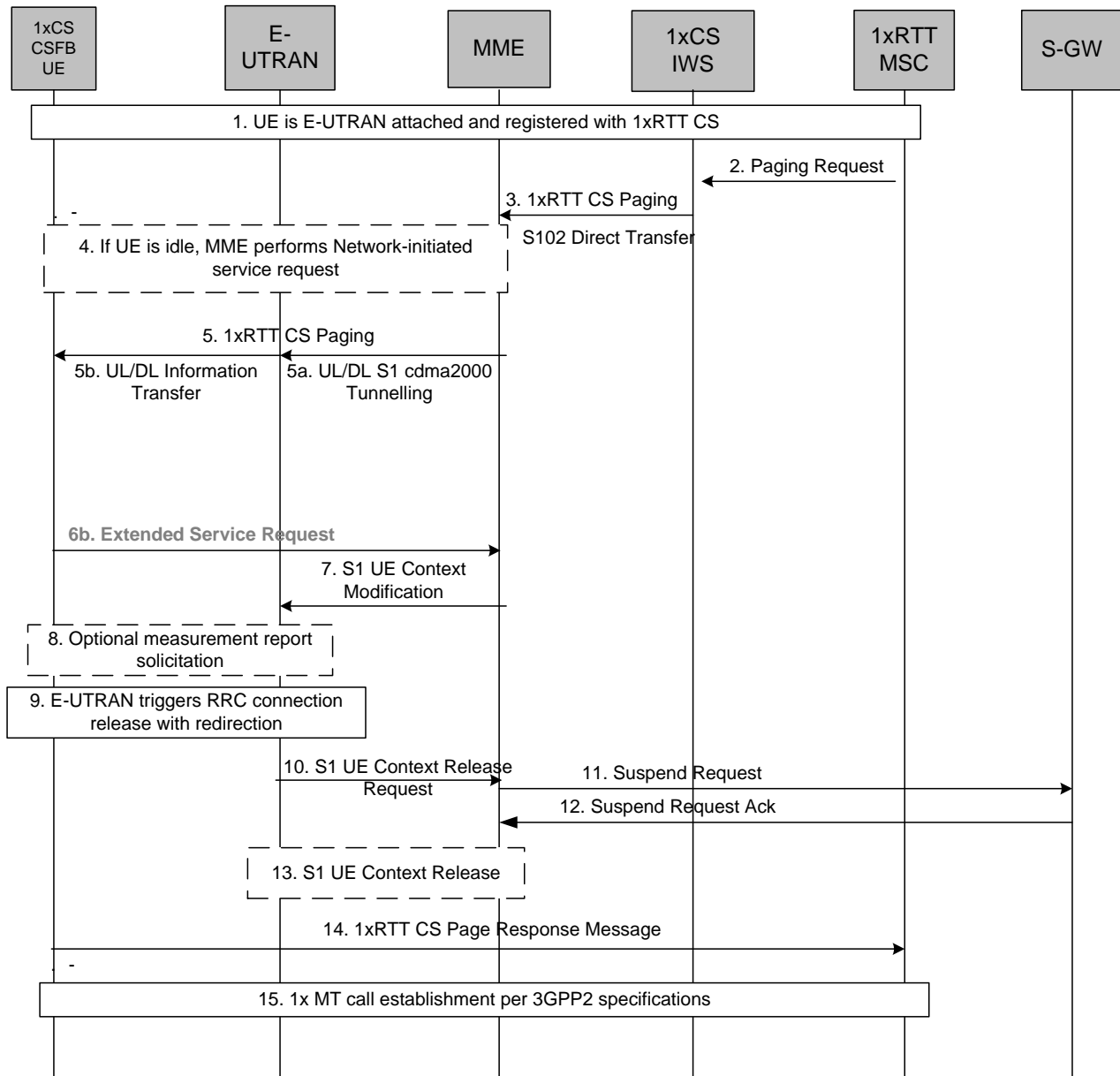


Figure B.2.3-1: CS MT call using fallback to CDMA 1x RTT network

1. UE is E-UTRAN attached and pre-registered with 1xRTT CS as defined in clause B.2.1.1.
2. 1xMSC sends a paging request to the 1xCS IWS node with Caller Line Identification if available.
3. 1xCS IWS node forwards the 1x RTT CS paging request with Caller Line Identification if available via the S102 tunnel to the MME.
4. If the UE is in idle state, the MME performs the network initiated Service Request procedure in order to bring the UE to active state prior to tunnelling of the 1x RTT CS paging request toward the UE.

5. MME forwards the 1xRTT CS paging request to the UE.
- 6a. Void.
- 6b. If the UE accepts CS paging for the CS Fallback to 1xRTT, the UE sends an Extended Service Request (CS Fallback Indicator) to the MME and proceeds with step 7 to step 15 below.
7. MME sends S1-AP: UE Context Modification (UE capabilities, CS Fallback Indicator) to indicate the E-UTRAN to move the UE to 1xRTT.
8. E-UTRAN may optionally solicit a measurement report from the UE to determine the target 1xRTT cell to which the CS Fallback will be performed.
9. E-UTRAN triggers RRC connection release with redirection to 1xCS.
10. E-UTRAN sends an S1 UE Context Release Request (Cause) message to the MME. Cause indicates that the S1 UE Context Release was caused by CS fallback to 1xRTT.
11. MME sets the UE context to suspended status and sends to the S-GW a Suspend Request (IMSI) message that requests the suspension of EPS bearers for the UE. The S1-U bearers are released for all EPS bearers by the MME and all GBR bearers are deactivated. The non-GBR bearers are preserved and are marked as suspended in the S-GW.
12. S-GW acknowledges the Suspend Request message and marks the UE as suspended. When a downlink data arrives at the S-GW, the S-GW should not send a downlink data notification message to the MME if the UE is marked as suspended.
13. S1 UE Context in the E-UTRAN is released as specified in TS 23.401 [2].
14. UE tunes to 1xRTT and acknowledges the page by transmitting a 1xRTT Paging Response message over the 1x Access Channel.
15. Subsequently UE performs the procedure for mobile terminated call establishment as specified in 3GPP2 A.S0013-D v4.0 [18].

8.4.7.3.3 Test description

8.4.7.3.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 19.
- Cell 19 has a lower reselection priority than Cell 1.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle mode pre-registered on 1xRTT (state 2C) on Cell 1 according to [18].
-

8.4.7.3.3.2 Test procedure sequence

Table 8.4.7.3.3.2-1 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, while row 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 8.4.7.3.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|-----------------------|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Srxlev _{Cell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | Ior/Ioc | dB | - | - | |
| | Pilot Ec/Ior | dB | - | - | |
| | Ioc | dBm/1.23 MHz | - | - | |
| | Pilot Ec/Io (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 in on, with S _{ServingCell} > Thresh _{serv, low} and S _{nonServingCell, x} < Thresh _{x, low} . |
| | Ior/Ioc | dB | - | 0 | |
| | Pilot Ec/Ior | dB | - | -7 | |
| | Ioc | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/Io (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-----|---|------------------|------------------------------------|----|---------|
| | | U - S | Message | | |
| 1-8 | Steps 2 to 9 of the generic radio bearer establishment procedure (TS 36.508 4.5.3.3-1) are executed to successfully complete the service request procedure. | | | | |
| 9 | The SS changes the cell power levels according to "T1" in Table 8.4.7.3.3.2-1. | | | | |
| 10 | The SS transmits a <i>DLInformationTransfer</i> containing a <i>1x RTT GCSNA encapsulated General Page</i> message on Cell 1. | <-- | <i>DLInformationTransfer</i> | - | - |
| 11 | The CS paging for the CS Fallback to 1xRTT is accepted at the UE. | - | - | - | - |
| 12 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 13 | The SS transmits an <i>RRCConnectionRelease</i> message on Cell 1 redirecting the UE to Cell 19. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 14 | The UE tunes to 1xRTT radio. | - | - | - | - |
| 15 | Check: Does the UE transmit a <i>Page Response</i> message on Cell 19? | --> | <i>Page Response</i> | 2 | P |
| 16 | The SS transmits an <i>Extended Channel Assignment</i> message on Cell 19. | <-- | <i>Extended Channel Assignment</i> | - | - |
| 17 | After the SS detects that Traffic Channel Initialization is successful, it transmits an <i>Acknowledgement Order</i> message on Cell 19. | <-- | <i>Acknowledgement Order</i> | - | - |
| 18 | The SS transmits a <i>Service Connect</i> message on Cell 19. | <-- | <i>Service Connect</i> | - | - |
| 19 | The UE transmits a <i>Service Connect Completion</i> message on Cell 19. | --> | <i>Service Connect Completion</i> | - | - |

8.4.7.3.3.3 Specific message contents

Table 8.4.7.3.3.3-1: Void**Table 8.4.7.3.3.3-2: Void****Table 8.4.7.3.3.3-3: DLInformationTransfer (step 10, Table 8.4.7.3.3.2-2)**

| Derivation Path: 36.508 Table 4.6.1-3 | | | |
|---------------------------------------|--------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| DLInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| dlInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoCDMA2000-1XRTT | Set according to Table 8.4.7.3.3.3-4 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.3.3.3-4: 1xRTT GCSNA encapsulated General Page message (step 10, Table 8.4.7.3.3.2-2)

| Field | Value/remark | Comment | Condition |
|-----------------------------|--------------------|-------------------------------|-----------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | 6 bits, Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '0000110'B | | |
| MsgType | '00010001'B | General Page Message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| Service_Option | 16 bits, Set by SS | | |

Table 8.4.7.3.3.3-5: ULInformationTransfer (step 12, Table 8.4.7.3.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|--|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.3.3.3-6 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.3.3.3-6: EXTENDED SERVICE REQUEST (step 12, Table 8.4.7.3.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0001'B | mobile terminating CS fallback or 1xCS fallback | |
| CSFB response | '001'B | CS fallback accepted by the UE | |

Table 8.4.7.3.3.3-7: RRCConnectionRelease (step 13, Table 8.4.7.3.3.2-2)

| Derivation Path: 36.508 table 4.6.1-15 | | | |
|--|-------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionRelease ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionRelease-r8 SEQUENCE { | | | |
| redirectedCarrierInfo ::= CHOICE { | | | |
| cdma2000-1xRTT | cdma2000-CarrierInfo for Cell 19 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.3.3.3-8: Page Response (step 15, Table 8.4.7.3.3.2-2)

| Field PD | Value/remark '01'B | Comment | Condition |
|-----------------------|-----------------------|-----------------------|--------------------------------------|
| MSG_ID | '000101'B | Page Response Message | this value shall be verified by TTCN |
| LAC Length Field | 5 bits, Set by UE | | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| VALID_ACK | '1'B | | |
| ACK_TYPE | '010'B | | |
| MSID_TYPE | 3 bits, Set by UE | | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| LAC Padding Field | 0 to 7, Set by UE | | |
| ACTIVE_PILOT_STRENGTH | 6 bits, set by UE | | |
| FIRST_IS_ACTIVE | 1 bit, set by UE | | |
| FIRST_IS_PTA | 1 bit, set by UE | | |
| NUM_ADD_PILOTS | '0'B | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SERVICE_OPTION | 16 bits, Set by UE | | |
| PM | '0'B | | |
| NAAR_AN_CAP | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH_FRAME_SIZE | '0'B | | |
| FOR_FCH_LEN | 3 bits, Set by UE | | |
| FOR_FCH_RC_MAP | Variable, Set by UE | | |
| REV_FCH_LEN | 3 bits, Set by UE | | |
| REV_FCH_RC_MAP | Variable, Set by UE | | |
| DCCH_SUPPORTED | '1'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.3.3.3-9: *Extended Channel Assignment* (step 16, Table 8.4.7.3.3.2-2)

| Field | Value/remark | Comment | Condition |
|---------------------|-----------------------|-------------------------------------|-----------|
| MSG_TYPE | '00010101'B | Extended Channel Assignment Message | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '0'B | | |
| VALID_ACK | '1'B | | |
| ADDR_TYPE | 3 bits, Set by UE | | |
| ADDR_LEN | 4 bits, Set by UE | | |
| ADDRESS | Variable, Set by UE | | |
| RESERVED_1 | '0'B | | |
| ADD_RECORD_LEN | 8 bits, Set by UE | | |
| ASSIGN_MODE | '100'B | Traffic Channel Assignment | |
| RESERVED_2 | '00000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| BYPASS_ALERT_ANSWER | '1'B | | |
| GRANTED_MODE | '10'B | | |
| DEFAULT_CONFIG | '100'B | | |
| FOR_RC | '00011'B | | |
| REV_RC | '00011'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| ENCRYPT_MODE | '00'B | | |
| FPC_SUBCHAN_GAIN | '00001'B | | |
| RLGAIN_ADJ | 0000'B | | |
| NUM_PILOTS | '000'B | | |
| CH_IND | '01'B | | |
| CH_RECORD_LEN | 5 bits, Set by SS | | |
| CH_RECORD_FIELDS | Variable, Set by SS | | |
| REV_FCH_GATING_MODE | '0'B | | |
| RESERVED | 0 – 7 bits, Set by UE | | |
| PDU_PADDING | 0 – 7 bits, Set by UE | | |

Table 8.4.7.3.3.3-10: *Acknowledgment Order* (step 17, Table 8.4.7.3.3.2-2)

| Field | Value/remark | Comment | Condition |
|------------|-------------------|-----------------------------------|-----------|
| MSG_TYPE | '00000001'B | Order Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| ORDER | '010000'B | Base Station Acknowledgment Order | |
| ORDQ | '00000000'B | | |

Table 8.4.7.3.3.3-11: Service Connect (step 18, Table 8.4.7.3.3.2-2)

| Field | Value/remark | Comment | Condition |
|----------------------|---------------------|-------------------------|-----------|
| MSG_TYPE | '00010100'B | Service Connect Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | 1'B | | |
| ENCRYPTION | '00'B | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| SERV_CON_SEQ | Set by SS | | |
| RESERVED | '00000'B | | |
| RECORD_TYPE | '00000111'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| RECORD_TYPE | '00010011'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| PDU_PADDING | 0-7 bits, Set by SS | | |

Table 8.4.7.3.3.3-12: Service Connect Completion (step 19, Table 8.4.7.3.3.2-2)

| Field | Value/remark | Comment | Condition |
|--------------|---|------------------------------------|--------------------------------------|
| MSG_TYPE | '00001110'B | Service Connect Completion Message | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| SERV_CON_SEQ | Same value as SERV_CON_SEQ received in Service Connect Message (Table 8.4.7.3.3.3-11) | | |
| PDU_PADDING | 0-7 bits, Set by UE | | |

8.4.7.4 Pre-registration at 1xRTT and inter-RAT Redirection / CS fallback from E-UTRA RRC_CONNECTED to 1xRTT / MO call

8.4.7.4.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and having completed the 1xRTT CS pre-registration procedure }
ensure that {
  when { a voice call is originated at the UE }
  then { UE transmits an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
}
```

(2)

```
with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
ensure that {
  when { SS transmits a RRCConnectionRelease message with redirection to 1xRTT }
  then { UE tunes to 1xRTT cell and transmits a 1xRTT Origination message on 1xRTT cell }
}
```


8.4.7.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.2.

[TS 23.272, clause B.2.2]

This clause describes the mobile originating call procedures for the CS Fallback to 1xRTT.

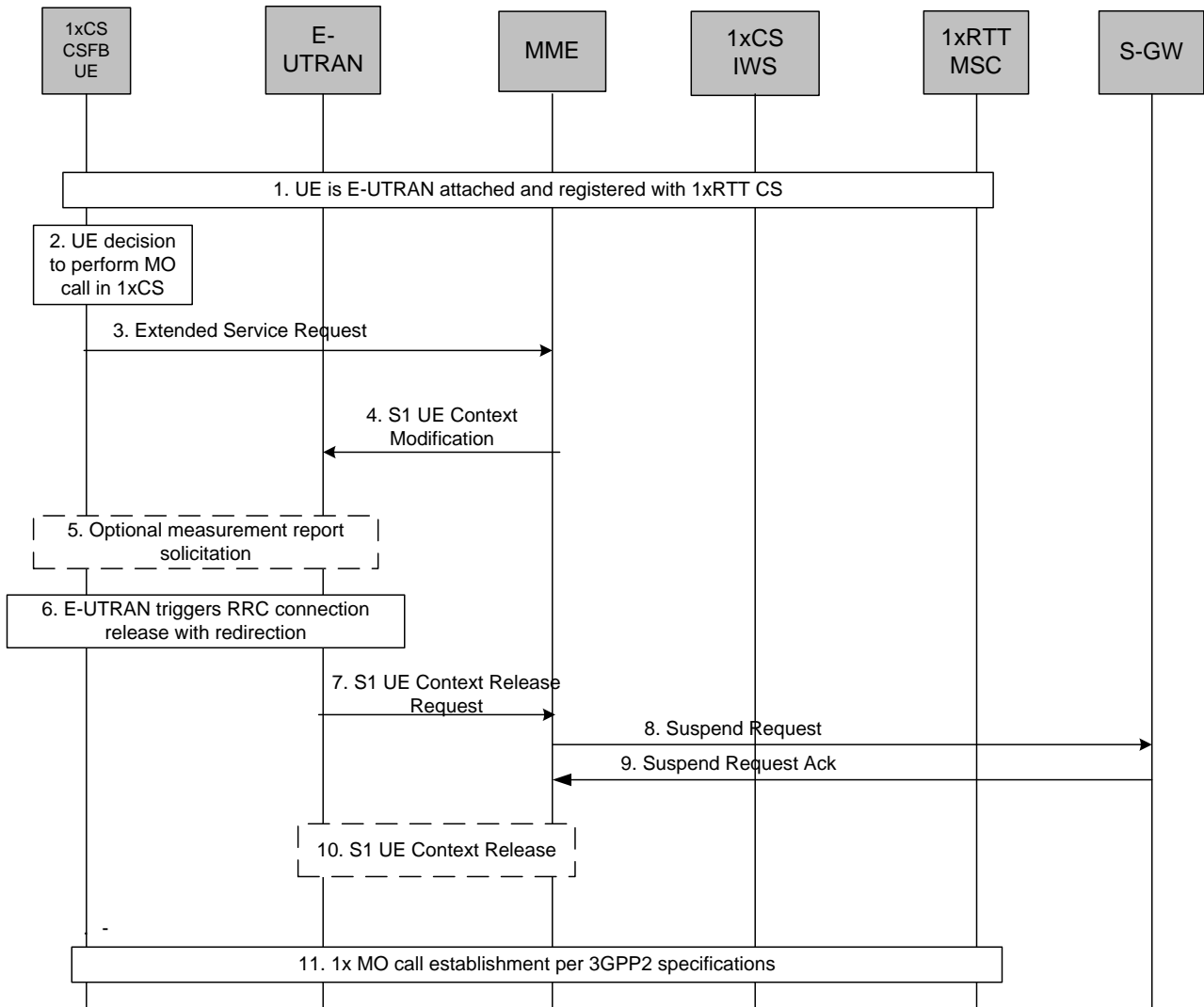


Figure B.2.2-1: CS MO call using fallback to CDMA 1x RTT network

1. UE is E-UTRAN attached and registered with 1xRTT CS as defined in clause B.2.1.1.
2. UE makes a decision to perform a mobile originated CS call.
3. UE sends an Extended Service Request (CS Fallback Indicator) to the MME.
4. MME sends S1-AP: UE Context Modification (UE capabilities, CS Fallback Indicator) to indicate the E-UTRAN to move the UE to 1xRTT.
5. E-UTRAN may optionally solicit a measurement report from the UE to determine the target 1xRTT cell to which the CS Fallback will be performed.

6. E-UTRAN triggers RRC connection release with redirection to 1xCS.
7. E-UTRAN sends an S1 UE Context Release Request (Cause) message to the MME. Cause indicates that the S1 UE Context Release was caused by CS fallback to 1xRTT.
8. MME sets the UE context to suspended status and sends to the S-GW a Suspend Request (IMSI) message that requests the suspension of EPS bearers for the UE. The S1-U bearers are released for all EPS bearers by the MME and all GBR bearers are deactivated. The non-GBR bearers are preserved and are marked as suspended in the S-GW.
9. S-GW acknowledges the Suspend Request message and marks the UE as suspended. When a downlink data arrives at the S-GW, the S-GW should not send a downlink data notification message to the MME if the UE is marked as suspended.
10. S1 UE Context in the E-UTRAN is released as specified in TS 23.401 [2].
11. UE moves to 1xRTT and performs the procedure for mobile originating call as specified in 3GPP2 A.S0013-D v4.0 [18].

8.4.7.4.3 Test description

8.4.7.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 19.
- Cell 19 has a lower reselection priority than Cell 1.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established, pre-registered on 1xRTT (state 3C) on Cell 1 according to [18].
-

8.4.7.4.3.2 Test procedure sequence

Table 8.4.7.4.3.2-1 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, while row 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 8.4.7.4.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|-----------------------|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Srxlev _{Cell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | Ior/Ioc | dB | - | - | |
| | Pilot Ec/Ior | dB | - | - | |
| | Ioc | dBm/1.23 MHz | - | - | |
| | Pilot Ec/Io (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 in on, with S _{ServingCell} > Thresh _{serv, low} and S _{nonServingCell, x} < Thresh _{x, low} . |
| | Ior/Ioc | dB | - | 0 | |
| | Pilot Ec/Ior | dB | - | -7 | |
| | Ioc | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/Io (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | A voice call is originated at the UE | - | - | - | - |
| 2 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 3 | The SS changes the cell power levels according to "T1" in Table 8.4.7.3.3.2-1 and waits for 2 seconds. | - | - | - | - |
| 4 | The SS transmits an <i>RRCConnectionRelease</i> message on Cell 1 redirecting the UE to Cell 19. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 5 | The UE tunes to 1xRTT radio. | - | - | - | - |
| 6 | Check: Does the UE transmit an <i>Origination</i> message on Cell 19? | --> | <i>Origination</i> | 2 | P |
| 7 | The SS transmits an <i>Extended Channel Assignment</i> message on Cell 19. | <-- | <i>Extended Channel Assignment</i> | - | - |
| 8 | After the SS detects that Traffic Channel Initialization is successful, it transmits an <i>Acknowledgement Order</i> message on Cell 19. | <-- | <i>Acknowledgement Order</i> | - | - |
| 9 | The SS transmits a <i>Service Connect</i> message on Cell 19. | <-- | <i>Service Connect</i> | - | - |
| 10 | The UE transmits a <i>Service Connect Completion</i> message on Cell 19. | --> | <i>Service Connect Completion</i> | - | - |

8.4.7.4.3.3

Specific message contents

Table 8.4.7.4.3.3-1: Void

Table 8.4.7.4.3.3-2: Void

Table 8.4.7.4.3.3-3: ULInformationTransfer (step 2, Table 8.4.7.4.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|--|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.4.3.3-4 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.4.3.3-4: EXTENDED SERVICE REQUEST (step 2, Table 8.4.7.4.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0000'B | mobile originating CS fallback or 1xCS fallback | |
| CSFB response | Not present | | |

Table 8.4.7.4.3.3-5: RRCConnectionRelease (step 4, Table 8.4.7.4.3.2-2)

| Derivation Path: 36.508 table 4.6.1-15 | | | |
|--|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionRelease ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionRelease-r8 SEQUENCE { | | | |
| redirectedCarrierInfo ::= CHOICE { | | | |
| cdma2000-1xRTT | cdma2000-CarrierInfo for Cell 19 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.4.3.3-6: *Origination* (step 6, Table 8.4.7.4.3.2-2)

| Field PD | Value/remark '00'B | Comment | Condition |
|-----------------------|--|---------------------|--------------------------------------|
| MSG_ID | '000100'B | Origination Message | this value shall be verified by TTCN |
| LAC Length Field | 5 bits, Set by UE | | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| VALID_ACK | '0'B | | |
| ACK_TYPE | '010'B | | |
| MSID_TYPE | 3 bits, Set by UE | | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| LAC Padding Field | 0 to 7, Set by UE | | |
| ACTIVE_PILOT_STRENGTH | 6 bits, set by UE | | |
| FIRST_IS_ACTIVE | 1 bit, set by UE | | |
| FIRST_IS_PTA | 1 bit, set by UE | | |
| NUM_ADD_PILOTS | '0'B | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, Any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHARi | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH_FRAME_SIZE | '0'B | | |
| FOR_FCH_LEN | 3 bits, Set by UE | | |
| FOR_FCH_RC_MAP | Variable, Set by UE | | |
| REV_FCH_LEN | 3 bits, Set by UE | | |
| REV_FCH_RC_MAP | Variable, Set by UE | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.4.3.3-7: Extended Channel Assignment (step 7, Table 8.4.7.4.3.2-2)

| Field | Value/remark | Comment | Condition |
|---------------------|-----------------------|-------------------------------------|-----------|
| MSG_TYPE | '010101'B | Extended Channel Assignment Message | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '0'B | | |
| VALID_ACK | '1'B | | |
| ADDR_TYPE | 3 bits, Set by UE | | |
| ADDR_LEN | 4 bits, Set by UE | | |
| ADDRESS | Variable, Set by UE | | |
| RESERVED_1 | '0'B | | |
| ADD_RECORD_LEN | 8 bits, Set by UE | | |
| ASSIGN_MODE | '100'B | Traffic Channel Assignment | |
| RESERVED_2 | '00000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| BYPASS_ALERT_ANSWER | '1'B | | |
| GRANTED_MODE | '10'B | | |
| DEFAULT_CONFIG | '100'B | | |
| FOR_RC | '00011'B | | |
| REV_RC | '00011'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| ENCRYPT_MODE | '00'B | | |
| FPC_SUBCHAN_GAIN | '00001'B | | |
| RLGAIN_ADJ | 0000'B | | |
| NUM_PILOTS | '000'B | | |
| CH_IND | '01'B | | |
| CH_RECORD_LEN | 5 bits, Set by SS | | |
| CH_RECORD_FIELDS | Variable, Set by SS | | |
| REV_FCH_GATING_MODE | '0'B | | |
| RESERVED | 0 – 7 bits, Set by UE | | |
| PDU_PADDING | 0 – 7 bits, Set by UE | | |

Table 8.4.7.4.3.3-8: Acknowledgment Order (step 8, Table 8.4.7.4.3.2-2)

| Field | Value/remark | Comment | Condition |
|------------|-------------------|-----------------------------------|-----------|
| MSG_TYPE | '00000001'B | Order Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| ORDER | '010000'B | Base Station Acknowledgment Order | |
| ORDQ | '00000000'B | | |

Table 8.4.7.4.3.3-9: Service Connect (step 9, Table 8.4.7.4.3.2-2)

| Field | Value/remark | Comment | Condition |
|----------------------|---------------------|-------------------------|-----------|
| MSG_TYPE | '00010100'B | Service Connect Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| SERV_CON_SEQ | Set by SS | | |
| RESERVED | '00000'B | | |
| RECORD_TYPE | '00000111'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| RECORD_TYPE | '00010011'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| PDU_PADDING | 0-7 bits, Set by SS | | |

Table 8.4.7.4.3.3-10: Service Connect Completion (step 10, Table 8.4.7.4.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|--|------------------------------------|--------------------------------------|
| MSG_TYPE | '00001110'B | Service Connect Completion Message | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| SERV_CON_SEQ | Same value as SERV_CON_SEQ received in Service Connect Message (Table 8.4.7.4.3.3-9) | | |
| PDU_PADDING | 0-7 bits, Set by UE | | |

8.4.7.5 Pre-registration at 1xRTT and inter-RAT Handover / Enhanced CS fallback from E-UTRA RRC_IDLE to 1xRTT/MT call

8.4.7.5.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state having completed the 1xRTT CS pre-registration procedure and
having received a DLInformationTransfer message containing a 1xRTT GCSNA Encapsulated Paging message }
ensure that {
  when { CS paging for the CS Fallback to 1xRTT is accepted at the UE }
  then { UE transmits an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST
message with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" }
}
```

(2)

```
with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST
message with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" in response to
a 1xRTT CS Paging message }
ensure that {
  when { SS transmits HandoverFromEUTRAPreparationRequest message with cdma2000-type set to
'1xRTT' }
  then { UE transmits an ULHandoverPreparationTransfer message containing a tunnelled 1xRTT GCSNA
Encapsulated Page Response message }
```

(3)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message containing a tunnelled 1xRTT GCSNA Encapsulated Handoff Direction message }
  then { UE transmits a 1xRTT Handoff Completion message on the target 1xRTT cell }
}
    
```

8.4.7.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3a.4.

[TS 23.272, clause B.2.3a.4]

The following figure describes the mobile terminating call procedures for the enhanced CS Fallback to 1xRTT with concurrent non-optimised PS handover or optimised idle-mode PS handover, or without PS handover, in the normal case. Clause B.2.3b describes the procedure when the procedure is rejected by the MME.

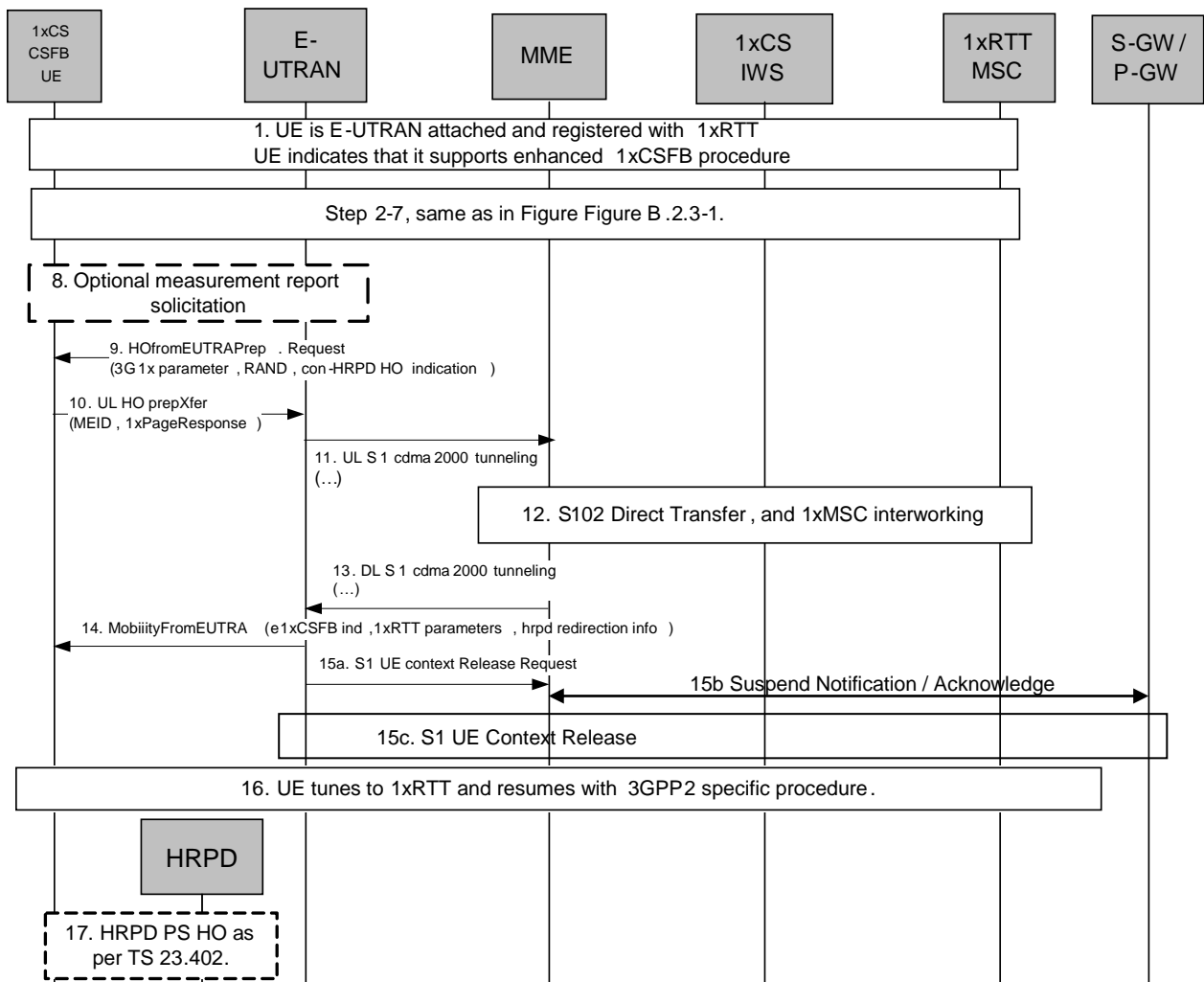


Figure B.2.3a.4-1: Enhanced CS fallback to 1xRTT MT call without PS handover, or with concurrent non-optimised PS handover or optimised idle-mode PS handover

1. UE is E-UTRAN attached and pre-registered with 1xRTT CS as defined in clause B.2.1.1 with enhanced CS fallback to 1xRTT capability indication to the network. The UE may also indicate that it supports concurrent 1xRTT and HRPD capability. The UE may also be pre-registered with HRPD access using procedures defined in TS 23.402 [27], clause 9.3.1.

2-7. Same as step 2-7 in figure B.2.3-1.

8-17. Same as steps 5 – 12 of Figure B.2.3a.2-1, with the modification that the 1x message in step 7 of Figure B.2.3a.2-1 provided by the UE to the E-UTRAN is a 1xPage Response message and 1x messages in step 9a of Figure B.2.3.a.2-1 (step 14a of Figure B.2.3a.4-1) provided by the E-UTRAN to UE may also contain Alert With Information message to provide caller line Identification and alerting trigger with 1x channel assignment message.

8.4.7.5.3 Test description

8.4.7.5.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 19.
- Cell 19 has a lower reselection priority than Cell 1.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle mode pre-registered on 1xRTT (state 2C) on Cell 1 according to [18].
-

8.4.7.5.3.2 Test procedure sequence

Table 8.4.7.5.3.2-1 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, while row 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 8.4.7.5.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|-----------------------|--------------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | S _{rxEVCell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | Ior/Ioc | dB | - | - | |
| | Pilot Ec/Ior | dB | - | - | |
| | Ioc | dBm/1.23 MHz | - | - | |
| | Pilot Ec/Io (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 in on, with S _{ServingCell} > Thresh _{serviNg, low} and S _{nonServingCell, x} < Thresh _{x, low} . |
| | Ior/Ioc | dB | - | 0 | |
| | Pilot Ec/Ior | dB | - | -7 | |
| | Ioc | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/Io (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.5.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-----|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1-8 | Steps 2 to 9 of the generic radio bearer establishment procedure (TS 36.508 4.5.3.3-1) are executed to successfully complete the service request procedure. | | | | |
| 9 | The SS changes the cell power levels according to "T1" in Table 8.4.7.5.3.2-1. | | | | |
| 10 | The SS transmits a <i>DLInformationTransfer</i> containing a <i>1xRTT GCSNA Encapsulated General Page</i> message on Cell 1. | <-- | <i>DLInformationTransfer</i> | - | - |
| 11 | The CS paging for the CS Fallback to 1xRTT is accepted at the UE. | - | - | - | - |
| 12 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 13 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to setup inter RAT measurement on Cell 19. | <-- | <i>RRCConnectionReconfiguration</i> | | |
| 14 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRCConnectionReconfigurationComplete</i> | | |
| 15 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 for Cell 19. | --> | <i>MeasurementReport</i> | | |
| 16 | The SS transmits a <i>HandoverFromEUTRAPreparationRequest</i> on Cell 1. | <-- | <i>HandoverFromEUTRAPreparationRequest</i> | | |
| 17 | Check: Does the UE transmit a tunnelled <i>1xRTT GCSNA Encapsulated Page Response</i> message contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 2 | P |
| 18 | The SS transmits a tunnelled <i>1xRTT GCSNA Encapsulated Handoff Direction</i> message contained in a <i>MobilityFromEUTRACommand</i> on Cell1 to order the UE to perform inter RAT handover to Cell 19. | <-- | <i>MobilityFromEUTRACommand</i> | | |
| 19 | The UE tunes to 1xRTT radio. | | | | |
| 20 | Check: Does the UE transmit a <i>1xRTT Handoff Completion</i> message on Cell 19? | --> | <i>Handoff Completion</i> | 3 | P |
| 21 | The SS transmits an <i>Alert With Information</i> message. | <-- | <i>Alert With Information</i> | | |
| 22 | The UE transmits a <i>Connect Order</i> . | --> | <i>Connect Order</i> | | |

8.4.7.5.3.3 Specific message contents

Table 8.4.7.5.3.3-1: DLInformationTransfer (Step 10, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-3 | | | |
|---------------------------------------|--------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| DLInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| dlInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoCDMA2000-1XRTT | Set according to Table 8.4.7.5.3.3-2 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-2: 1xRTT GCSNA Encapsulated General Page (Step 10, Table 8.4.7.5.3.2-2)

| Field | Value/remark | Comment | Condition |
|-----------------------------|--------------------|-------------------------------|-----------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | Set by UE | | |
| MsgType | '00010001'B | General Page Message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| PDU | | 1xL3 PDU | |
| Service_Option | 16 bits, Set by SS | | |

Table 8.4.7.5.3.3-3: ULInformationTransfer (Step 12, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|--|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.5.3.3-4 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-4: EXTENDED SERVICE REQUEST (Step 12, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0001'B | mobile terminating CS fallback or 1xCS fallback | |
| CSFB response | '001'B | CS fallback accepted by the UE | |

Table 8.4.7.5.3.3-5: RRCConnectionReconfiguration (Step 13, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|
|--|

Table 8.4.7.5.3.3-6: MeasConfig (Step 13, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| measObject[1] | MeasObjectCDMA2000- GENERIC | | |
| measObjectId[2] | IdMeasObject-f1 | | |
| measObject[2] | MeasObjectEUTRA- GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2- CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT- B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| reportConfigId[1] | IdReportConfig-B2- CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigEUTRA | Not present | | |
| quantityConfigUTRA | Not present | | |
| quantityConfigGERAN | Not present | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotPnPhaseAndPilotStre ngth | | |
| } | | | |
| } | | | |
| measGapConfig CHOICE { | | | |
| setup SEQUENCE { | | | |
| gapOffset CHOICE { | | | |
| gp1 | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-7: *MeasObjectCDMA2000-GENERIC* (Step 13, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f17 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE {} | Cell 19 | | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.7.5.3.3-8: *MeasurementReport* (Step 15, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | FALSE | | |
| measResultListCDMA2000 ::=SEQUENCE | 1 entry | | |
| (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 19 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotPnPhase | (0..32767) | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-9: HandoverFromEUTRAPreparationRequest (Step 16, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Rand | Set by SS | Random Challenge Data as broadcast on Cell 19 | |
| mobilityParameters | Set according to 36.508 Table 4.5.2C.4-6 | CDMA2000Parameters | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-10: ULHandoverPreparationTransfer (Step 17, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Meid | UE's meid | | |
| dedicatedInfo | Set according to Table 8.4.7.5.3.3-11 | 1xRTT GCSNA Encapsulated Page Response message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-11: 1xRTT GCSNA Encapsulated Page Response (Step 17, Table 8.4.7.5.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-------------------------------------|---------------------|---------------------------------------|--------------------------------------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | 6 bits, Set by UE | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000101'B | Page Response message | this value shall be verified by TTCN |
| NumTLACHeaderRecords | '0001'B | | |
| TLACHeaderRecordType | '0000'B | | |
| TLACHeaderRecordLength | 8 bits, Set by UE | | |
| MSID_TYPE | 3 bits, Set by UE | Should be matched with PREF_MSID_TYPE | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| Reserved | '0000000'B | | |
| 1xL3PDULength | 16 bits, Set by UE | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SERVICE_OPTION | 16 bits, Set by UE | | |
| PM | '0'B | | |
| NAR_AN_CAP | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| NUM_ALT_SO | '000'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '0'B | | |
| OTD_SUPPORTED | '0000'B | | |
| QPCH_SUPPORTED | '0'B | | |
| ENHANCED_RC | '0'B | | |
| FOR_RC_PREF | '0000'B | | |
| REV_RC_PREF | '0'B | | |
| FCH_SUPPORTED | '0'B | | |
| FCH Capability Type-specific fields | Variable | | |
| DCCH_SUPPORTED | '1'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.5.3.3-12: *MobilityFromEUTRACommand* (Step 18, Table 8.4.7.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-6 | | | |
|---|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r9 SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE{ | | | |
| e-CSFB-r9 SEQUENCE { | | | |
| messageContCDMA2000-1XRTT-r9 | Set according to Table 8.4.7.5.3.3-13 | 1xRTT GCSNA Encapsulated Handoff Direction message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.5.3.3-13: 1xRTT GCSNA Encapsulated Handoff Direction (Step 18, Table 8.4.7.5.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------------|--------------------|-------------------------------------|-----------|
| MessageID | '00000001'B | | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '1'B | | |
| 1xProtocolRevision | '0000110'B | | |
| MsgType | '00100010'B | Universal Handoff Direction message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| HDM_SEQ | 2 bits, Set by SS | | |
| PARMS_INCL | '1'B | | |
| P_REV | '00000110'B | | |
| SERV_NEG_TYPE | '1'B | | |
| SEARCH_INCLUDED | '1'B | | |
| SRCH_WIN_A | '1000'B | | |
| SRCH_WIN_N | '1001'B | | |
| SRCH_WIN_R | '1011'B | | |
| T_ADD | '010100'B | | |
| T_DROP | '011110'B | | |
| T_COMP | '1010'B | | |
| T_TDROP | '0100'B | | |
| SOFT_SLOPE | '000000'B | | |
| ADD_INTERCEPT | '000000'B | | |
| DROP_INTERCEPT | '000000'B | | |
| EXTRA_PARMS | '1'B | | |
| PACKET_ZONE_ID | '00000000'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| PRIVATE_LCM | '0'B | | |
| RESET_L2 | '1'B | | |
| RESET_FPC | '1'B | | |
| ENCRYPT_MODE | '00'B | | |
| NOM_PWR_EXT | '0'B | | |
| NOM_PWR | '0000'B | | |
| RLGAIN_TRAFFIC_PILOT | '000000'B | | |
| DEFAULT_RLAG | '1'B | | |
| NUM_PREAMBLE | '000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| RETURN_IF_HANDOFF_FAIL | '0'B | | |
| PERIODIC_SEARCH | '0'B | | |
| SCR_INCLUDED | '1'B | | |
| NNSCR_INCLUDED | '1'B | | |
| USE_PWR_CNTL_STEP | '0'B | | |
| CLEAR_RETRY_DELAY | '0'B | | |
| SCH_INCL | '1'B | | |
| FPC_SUBCHAN_GAIN | '01010'B | | |
| USE_PC_TIME | '0'B | | |
| CH_IND | '101'B | | |
| ACTIVE_SET_REC_LEN | 8 bits, Set by SS | | |
| NUM_PILOTS | '001'B | | |
| SRCH_OFFSET_INCL | '1'B | | |
| PILOT_PN | '000000000'B | | |
| SRCH_OFFSET | '010'B | | |

| | | | |
|---------------------|--------------------|--|--|
| ADD_PILOT_REC_INCL | '0'B | | |
| PWR_COMB_IND | '0'B | | |
| CODE_CHAN_FCH | 11 bits, Set by SS | | |
| QOF_MASK_ID_FCH | '00'B | | |
| RESERVED | 0-7 bits | | |
| REV_FCH_GATING_MODE | '0'B | | |

Table 8.4.7.5.3.3-14: 1xRTT Handoff Completion (Step 20, Table 8.4.7.5.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|--|--------------|--------------------------------------|
| MSG_ID | '00001010' | LAC | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| LAST_HDM_SEQ | Same value as HDM_SEQ in 1xRTT Handoff Direction message at Step 9 | 1xRTT L3 PDU | |
| PILOT_PN | Same value as PILOT_PN included in 1xRTT Handoff Direction message at Step 9 | | |
| PDU_PADDING | 0 -7 bits, set by UE | | |

Table 8.4.7.5.3.3-15: 1xRTT Alert With Information (Step 21, Table 8.4.7.5.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|----------------------|--------------|-----------|
| MSG_ID | '00000011'B | LAC | |
| ACK_SEQ | FFS | | |
| MSG_SEQ | 3 bits, set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RECORD_TYPE | '00000011' | 1xRTT L3 PDU | |
| RECORD_LEN | 8bits, Set by SS | | |
| NUMBER_TYPE | 3bits, Set by SS | | |
| NUMBER_PLAN | 4bits, Set by SS | | |
| CHARi | Variable, set by SS | | |
| RESERVED | '0'B | | |
| PDU_PADDING | 0 -7 bits, set by UE | | |

Table 8.4.7.5.3.3-16: 1xRTT Connect Order (Step 22, Table 8.4.7.5.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|----------------------|--------------|--------------------------------------|
| MSG_ID | '00000001'B | LAC | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, set by UE | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| ORDER | '011000'B | 1xRTT L3 PDU | |
| ADD_RECORD_LEN | '001'B | | |
| ORDQ | '00000000'B | | |
| PDU_PADDING | 0 -7 bits, set by UE | | |

8.4.7.6 Pre-registration at 1xRTT and inter-RAT handover / Enhanced CS fallback from E-UTRA RRC_CONNECTED to 1xRTT/MO call

8.4.7.6.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and having completed the 1xRTT CS pre-registration procedure }
ensure that {
  when { a voice call is originated at the UE }
  then { UE transmits an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
}
```

(2)

```
with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
ensure that {
  when { SS transmits HandoverFromEUTRAPreparationRequest message with cdma2000-type set to 'type1XRTT' }
  then { UE transmits an ULHandoverPreparationTransfer message containing a tunnelled 1xRTT GCSNA Encapsulated Origination message }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message containing a tunnelled 1xRTT GCSNA Encapsulated Handoff Direction message }
  then { UE transmits a 1xRTT Handoff Completion message on the target 1xRTT cell }
}
```

8.4.7.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3a.2.

[TS 23.272, clause B.2.3a.2]

The following figure describes the mobile originating call procedures for the enhanced CS Fallback to 1xRTT with concurrent non-optimised PS handover or optimised idle-mode PS handover, or without concurrent PS handover, in the normal case. Clause B.2.3b describes the procedure when the procedure is rejected by the MME.

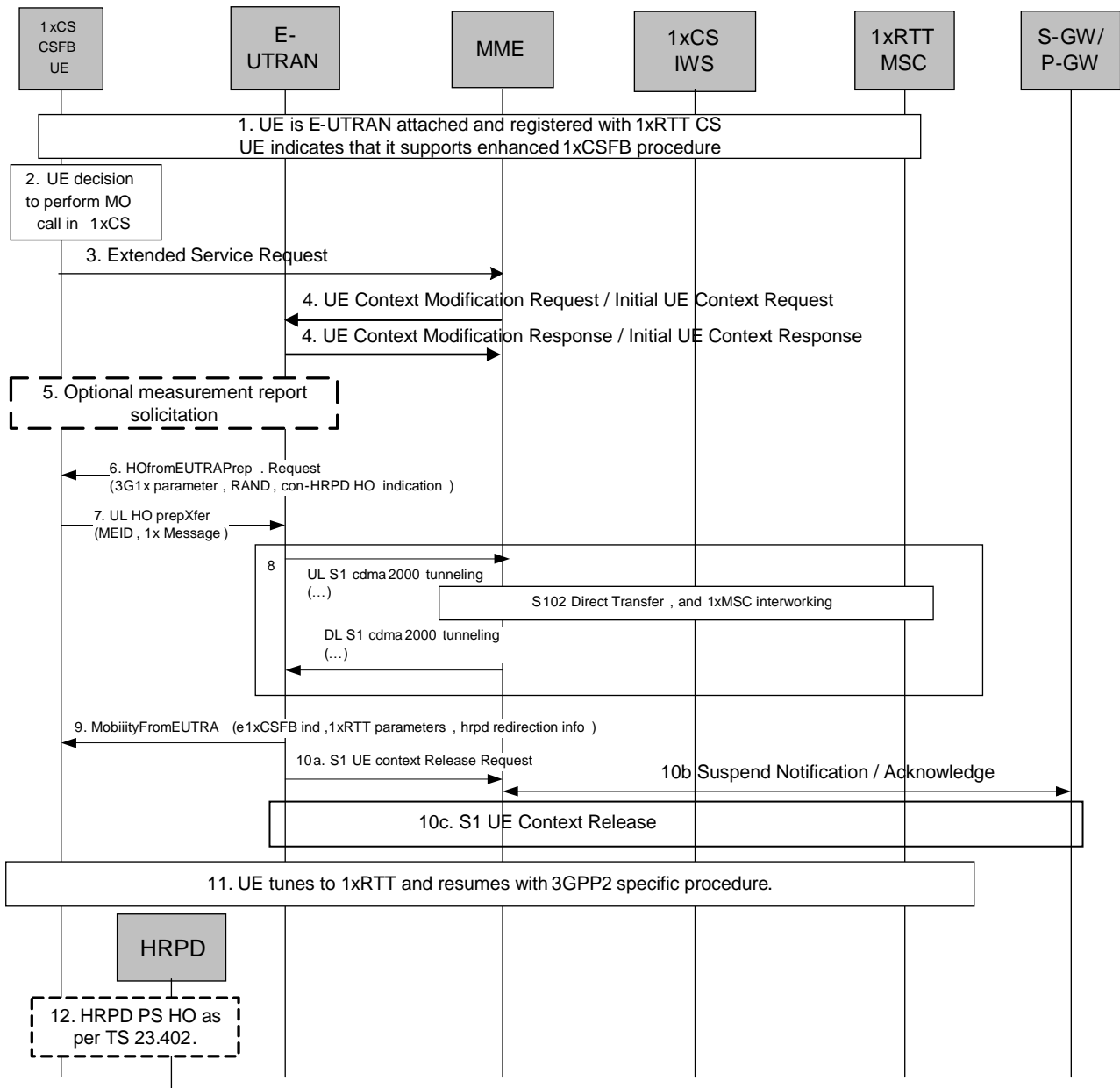


Figure B.2.3a.2-1: Enhanced CS fallback to 1xRTT MO Call with no PS handover, or with concurrent non-optimised PS handover or optimised idle-mode PS handover

1. UE is E UTRAN attached and registered with 1xRTT CS as defined in clause B.2.1.1 with enhanced CS fallback to 1xRTT capability indication to the network. The UE may also indicate that it supports concurrent 1xRTT and HRPD capability.. The UE may also be pre-registered with HRPD access using procedures defined in TS 23.402 [27], clause 9.3.1.
2. UE makes a decision to perform a mobile originated CS call.
3. UE sends an Extended Service Request (CS Fallback Indicator) to the MME.
4. For a UE in active mode, MME sends UE Context Modification Request (CS Fallback Indicator) to E-UTRAN. CS Fallback Indicator indicates to the E UTRAN to move the UE to 1xRTT. E-UTRAN responds with UE Context Modification Response.

For a UE in idle mode, MME sends Initial UE Context Request (CS Fallback Indicator) to E-UTRAN. CS Fallback Indicator indicates to the E-UTRAN to move the UE to 1xRTT. E-UTRAN responds with Initial UE Context Response.

5. E-UTRAN may optionally solicit a 1xRTT measurement report from the UE to determine the target 1xRTT cell to which the CS Fallback will be performed.

If the network supports PS handover procedure to HRPD then E-UTRAN may optionally solicit an HRPD measurement report from the UE to determine whether the target HRPD candidates exist or not. If the network does not support PS handover procedure to HRPD or if no target HRPD candidates exist then E-UTRAN shall release the S1 UE context (see step 10a/b) after executing the enhanced CS fallback to 1xRTT procedure.

6. E-UTRAN sends a HandoverFromE-UTRAPreparation Request message to the UE to start the enhanced 1xCS fallback procedure. It includes 3G1x Overhead Parameters and RAND value. This message also includes an indication that concurrent HRPD handover preparation is not required.
 7. The UE initiates signalling for establishment of the CS access leg by sending UL HandoverPreparation Transfer message which contains the 1xRTT Origination message with called party number.
 8. Messages between MME and 1xIWS are tunnelled using the S102 interface. The 1xRTT MSC initiates the call with the called party number carried in the 1xRTT Origination message.
 9. The E-UTRAN sends Mobility from EUTRA Command to the UE with indication that this is for enhanced 1x CS Fallback operation, 1xRTT related information, and optionally the HRPD redirection information. The 1xRTT information contains 1xRTT messages related to 1x channel assignment and cause the UE to tune to and acquire this 1x channel. This is perceived by the UE as a Handover Command message to 1xRTT. If 1xRTT CS network cannot support this CSFB request (for example due to resource availability), the DL information transfer message is sent instead, with an embedded 1x message that indicates failure to the UE.
 - For either concurrent non-optimised PS handover procedure or optimised idle-mode PS handover procedure along with enhanced CS fallback to 1xRTT, E-UTRAN may also redirect the UE to HRPD as part of this procedure. This is indicated by the HRPD redirection information in the Mobility from EUTRA Command.
- 10a/b/c. If PS handover procedure is not performed then E-UTRAN sends an S1 UE Context Release Request (Cause) message to the MME. Cause indicates that the S1 UE Context Release was caused by CS fallback to 1xRTT. The S1-U bearers are released and the MME starts the preservation and suspension of non-GBR bearers and the deactivation of GBR bearers towards S-GW and P-GW(s). The MME sets the UE context to suspended status.
11. UE retunes to the 1xRTT radio access network and performs 1xchannel acquisition with the 1xRTT CS access (e.g. 1xRTT BSS).
 12. UE and Network follow the appropriate procedure for handling non-optimised PS handover procedure or optimised idle-mode PS handover as defined in TS 23.402 [27] if performed. S1 UE Context release procedure is as specified in TS 23.402 [27] for non-optimised PS handover (clause 8.2.2) or optimised idle-mode PS handover (clause 9.4). This step occurs in parallel with step 11.

8.4.7.6.3 Test description

8.4.7.6.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 19.
- Cell 19 has a lower reselection priority than Cell 1.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established, pre-registered on 1xRTT (state 3C) on Cell 1 according to [18].
-

8.4.7.6.3.2 Test procedure sequence

Table 8.4.7.6.3.2-1 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, while row 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 8.4.7.6.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|----------------------------------|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | S _r xlev _{Cell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | I _{or} /I _{oc} | dB | - | - | |
| | Pilot Ec/I _{or} | dB | - | - | |
| | I _{oc} | dBm/1.23 MHz | - | - | |
| | Pilot Ec/I _o (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 is on, with S _{ServingCell} > Thresh _{servi_{ng},low} and S _{nonServingCell, x} < Thresh _{x,low} . |
| | I _{or} /I _{oc} | dB | - | 0 | |
| | Pilot Ec/I _{or} | dB | - | -7 | |
| | I _{oc} | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/I _o (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.6.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | A voice call is originated at the UE | - | - | - | - |
| 2 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 3 | The SS changes the cell power levels according to "T1" in Table 8.4.7.6.3.2-1. | | | | |
| 4 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to setup inter RAT measurement on Cell 19. | <-- | <i>RRCConnectionReconfiguration</i> | | |
| 5 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRCConnectionReconfigurationComplete</i> | | |
| 6 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 for Cell 19. | --> | <i>MeasurementReport</i> | | |
| 7 | The SS transmits a <i>HandoverFromEUTRAPreparationRequest</i> on Cell 1. | <-- | <i>HandoverFromEUTRAPreparationRequest</i> | | |
| 8 | Check: Does the UE transmit a tunnelled <i>1xRTT GCSNA Encapsulated Origination</i> message contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 2 | P |
| 9 | The SS transmits a tunnelled <i>1xRTT GCSNA Encapsulated Handoff Direction</i> message contained in a <i>MobilityFromEUTRACommand</i> on Cell 1 to order the UE to perform inter RAT handover to Cell 19. | <-- | <i>MobilityFromEUTRACommand</i> | | |
| 10 | The UE tunes to 1xRTT radio. | | | | |
| 11 | Check: Does the UE transmit a <i>1xRTT Handoff Completion</i> message on Cell 19? | --> | <i>Handoff Completion</i> | 3 | P |

8.4.7.6.3.3 Specific message contents

Table 8.4.7.6.3.3-1: *ULInformationTransfer* (Step 2, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|---|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>ULInformationTransfer</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.6.3.3-2 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.6.3.3-2: EXTENDED SERVICE REQUEST (Step 2, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0000'B | mobile originating CS fallback or 1xCs fallback | |
| CSFB response | Not present | | |

Table 8.4.7.6.3.3-3: RRCConnectionReconfiguration (Step 4, Table 8.4.7.6.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.4.7.6.3.3-4: MeasConfig (Step 4, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| measObject[1] | MeasObjectCDMA2000- GENERIC | | |
| measObjectId[2] | IdMeasObject-f1 | | |
| measObject[2] | MeasObjectEUTRA- GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2- CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT- B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| reportConfigId[1] | IdReportConfig-B2- CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigEUTRA | Not present | | |
| quantityConfigUTRA | Not present | | |
| quantityConfigGERAN | Not present | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotPnPhaseAndPilotStre ngth | | |
| } | | | |
| } | | | |
| measGapConfig CHOICE { | | | |
| setup SEQUENCE { | | | |
| gapOffset CHOICE { | | | |
| gp1 | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.6.3.3-5: MeasObjectCDMA2000-GENERIC (Step 4, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f17 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE {} | Cell 19 | | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.7.6.3.3-6: MeasurementReport (Step 6, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | FALSE | | |
| measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 19 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotPnPhase | (0..32767) | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.6.3.3-7: HandoverFromEUTRAPreparationRequest (Step 7, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Rand | Set by SS | Random Challenge Data as broadcast on Cell 19 | |
| mobilityParameters | Set according to 36.508 Table 4.5.2C.4-6 | CDMA2000Parameters | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.6.3.3-8: ULHandoverPreparationTransfer (Step 8, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|--------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Meid | UE's meid | | |
| dedicatedInfo | Set according to Table 8.4.7.6.3.3-9 | 1xRTT GCSNA Encapsulated Origination message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.6.3.3-9: 1xRTT GCSNA Encapsulated Origination (Step 8, Table 8.4.7.6.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-------------------------------------|--|---------------------------------------|--------------------------------------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by UE | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000100'B | Origination message | this value shall be verified by TTCN |
| NumTLACHeaderRecords | '0001'B | | |
| TLACHeaderRecordType | '0000'B | | |
| TLACHeaderRecordLength | 4 bits, Set by UE | | |
| MSID_TYPE | 3 bits, Set by UE | Should be matched with PREF_MSID_TYPE | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| Reserved | '0000000'B | | |
| 1xL3PDULength | 16 bits, Set by UE | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHARi | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH Capability Type-specific fields | Variable | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |

| | | | |
|--------------------|------|--|--|
| REV_FCH_GATING_REQ | '0'B | | |
|--------------------|------|--|--|

Table 8.4.7.6.3.3-10: *MobilityFromEUTRACommand* (Step 9, Table 8.4.7.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-6 | | | |
|---|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r9 SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE{ | | | |
| e-CSFB-r9 SEQUENCE { | | | |
| messageContCDMA2000-1XRTT-r9 | Set according to Table 8.4.7.6.3.3-11 | 1xRTT GCSNA Encapsulated Handoff Direction message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.6.3.3-11: 1xRTT GCSNA Encapsulated Handoff Direction (Step 9, Table 8.4.7.6.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------------|--------------------|-------------------------------------|-----------|
| MessageID | '00000001'B | | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '1'B | | |
| 1xProtocolRevision | '0000110'B | | |
| MsgType | '00100010'B | Universal Handoff Direction message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDUlength | 16 bits, Set by SS | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| HDM_SEQ | 2 bits, Set by SS | | |
| PARMS_INCL | '1'B | | |
| P_REV | '00000110'B | | |
| SERV_NEG_TYPE | '1'B | | |
| SEARCH_INCLUDED | '1'B | | |
| SRCH_WIN_A | '1000'B | | |
| SRCH_WIN_N | '1001'B | | |
| SRCH_WIN_R | '1011'B | | |
| T_ADD | '010100'B | | |
| T_DROP | '011110'B | | |
| T_COMP | '1010'B | | |
| T_TDROP | '0100'B | | |
| SOFT_SLOPE | '000000'B | | |
| ADD_INTERCEPT | '000000'B | | |
| DROP_INTERCEPT | '000000'B | | |
| EXTRA_PARMS | '1'B | | |
| PACKET_ZONE_ID | '00000000'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| PRIVATE_LCM | '0'B | | |
| RESET_L2 | '1'B | | |
| RESET_FPC | '1'B | | |
| ENCRYPT_MODE | '00'B | | |
| NOM_PWR_EXT | '0'B | | |
| NOM_PWR | '0000'B | | |
| RLGAIN_TRAFFIC_PILOT | '000000'B | | |
| DEFAULT_RLAG | '1'B | | |
| NUM_PREAMBLE | '000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| RETURN_IF_HANDOFF_FAIL | '0'B | | |
| PERIODIC_SEARCH | '0'B | | |
| SCR_INCLUDED | '1'B | | |
| NNSCR_INCLUDED | '1'B | | |
| USE_PWR_CNTL_STEP | '0'B | | |
| CLEAR_RETRY_DELAY | '0'B | | |
| SCH_INCL | '1'B | | |
| FPC_SUBCHAN_GAIN | '01010'B | | |
| USE_PC_TIME | '0'B | | |
| CH_IND | '101'B | | |
| ACTIVE_SET_REC_LEN | 8 bits, Set by SS | | |
| NUM_PILOTS | '001'B | | |
| SRCH_OFFSET_INCL | '1'B | | |
| PILOT_PN | '000000000'B | | |
| SRCH_OFFSET | '010'B | | |

| | | | |
|---------------------|--------------------|--|--|
| ADD_PILOT_REC_INCL | '0'B | | |
| PWR_COMB_IND | '0'B | | |
| CODE_CHAN_FCH | 11 bits, Set by SS | | |
| QOF_MASK_ID_FCH | '00'B | | |
| RESERVED | 0-7 bits | | |
| REV_FCH_GATING_MODE | '0'B | | |

Table 8.4.7.6.3.3-12: 1xRTT Handoff Completion (Step 11, Table 8.4.7.6.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|--|---------|--------------------------------------|
| MSG_ID | '00001010' | | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| LAST_HDM_SEQ | Same value as HDM_SEQ in 1xRTT Handoff Direction message at Step 9 | | |
| PILOT_PN | Same value as PILOT_PN included in 1xRTT Handoff Direction message at Step 9 | | |

8.4.7.7 Pre-registration at 1xRTT and inter-RAT handover / Enhanced CS fallback from E-UTRA RRC_CONNECTED to e1XCSFB ECAM-based 1xRTT / MO call

8.4.7.7.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and having completed the 1xRTT CS pre-registration procedure }
ensure that {
  when { UE originates a voice call }
  then { UE transmits an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
}
```

(2)

```
with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
ensure that {
  when { UE receives HandoverFromEUTRAPreparationRequest message with cdma2000-type set to 'type1xRTT' }
  then { UE transmits an ULHandoverPreparationTransfer message containing a tunnelled 1xRTT GCSNA Encapsulated Origination message }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message containing a tunnelled 1xRTT GCSNA Encapsulated ECAM message }
  then { UE tunes to the 1X channel and pilots specified in the ECAM, and proceeds to send the ORM over the target 1xRTT cell }
}
```

8.4.7.7.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3a.2.

[TS 23.272, clause B.2.3a.2]

The following figure describes the mobile originating call procedures for the enhanced CS Fallback to 1xRTT with concurrent non-optimised PS handover or optimised idle-mode PS handover, or without concurrent PS handover, in the normal case. Clause B.2.3b describes the procedure when the procedure is rejected by the MME.

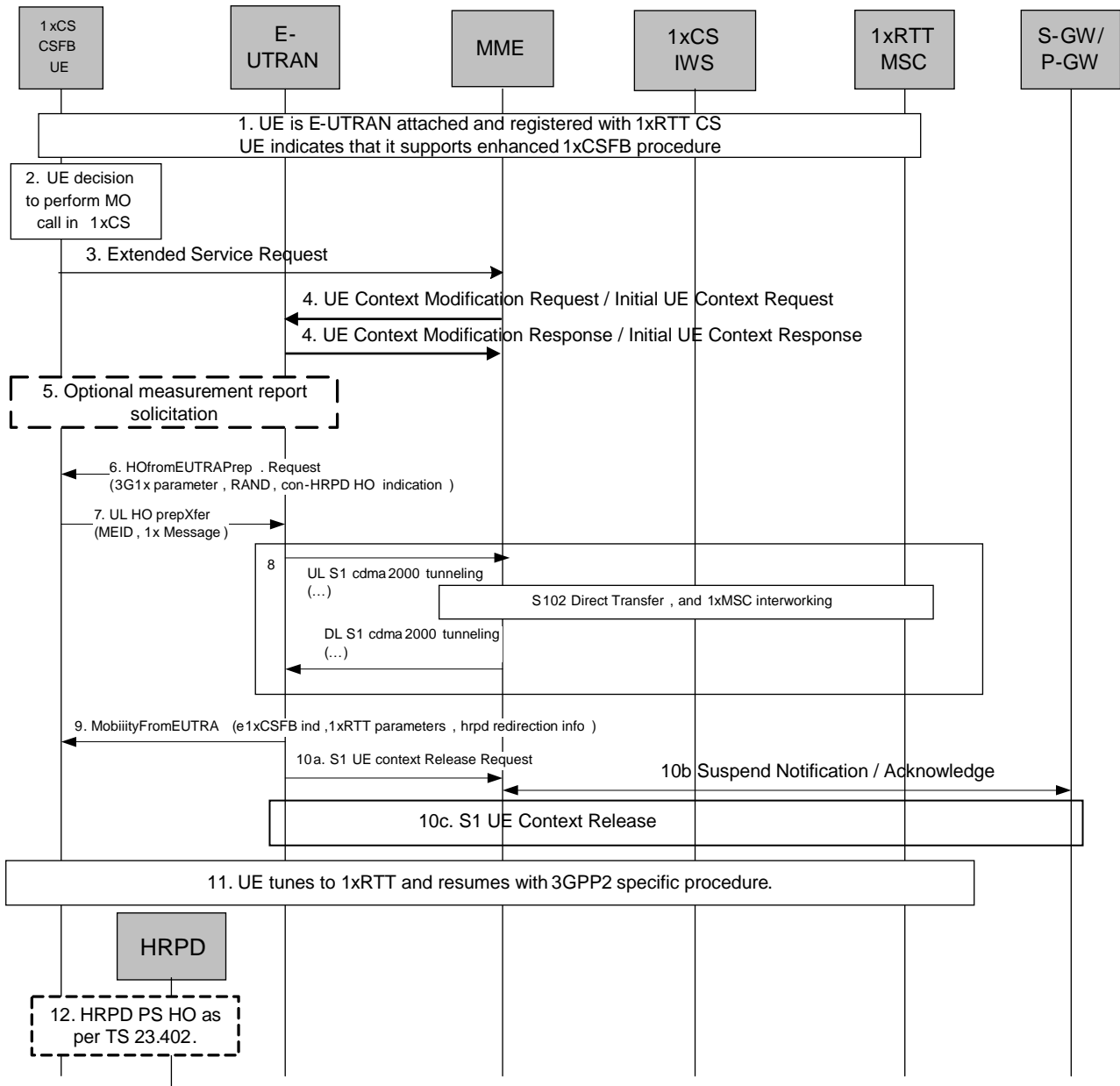


Figure B.2.3a.2-1: Enhanced CS fallback to 1xRTT MO Call with no PS handover, or with concurrent non-optimised PS handover or optimised idle-mode PS handover

1. UE is E-UTRAN attached and registered with 1xRTT CS as defined in clause B.2.1.1 with enhanced CS fallback to 1xRTT capability indication to the network. The UE may also indicate that it supports concurrent 1xRTT and HRPD capability.. The UE may also be pre-registered with HRPD access using procedures defined in TS 23.402 [27], clause 9.3.1.
2. UE makes a decision to perform a mobile originated CS call.

3. UE sends an Extended Service Request (CS Fallback Indicator) to the MME.
4. For a UE in active mode, MME sends UE Context Modification Request (CS Fallback Indicator) to E-UTRAN. CS Fallback Indicator indicates to the E-UTRAN to move the UE to 1xRTT. E-UTRAN responds with UE Context Modification Response.

For a UE in idle mode, MME sends Initial UE Context Request (CS Fallback Indicator) to E-UTRAN. CS Fallback Indicator indicates to the E-UTRAN to move the UE to 1xRTT. E-UTRAN responds with Initial UE Context Response.

5. E-UTRAN may optionally solicit a 1xRTT measurement report from the UE to determine the target 1xRTT cell to which the CS Fallback will be performed.

If the network supports PS handover procedure to HRPD then E-UTRAN may optionally solicit an HRPD measurement report from the UE to determine whether the target HRPD candidates exist or not. If the network does not support PS handover procedure to HRPD or if no target HRPD candidates exist then E-UTRAN shall release the S1 UE context (see step 10a/b) after executing the enhanced CS fallback to 1xRTT procedure.

6. E-UTRAN sends a HandoverFromE-UTRANPreparation Request message to the UE to start the enhanced 1xCS fallback procedure. It includes 3G1x Overhead Parameters and RAND value. This message also includes an indication that concurrent HRPD handover preparation is not required.
7. The UE initiates signalling for establishment of the CS access leg by sending UL HandoverPreparation Transfer message which contains the 1xRTT Origination message with called party number.
8. Messages between MME and 1xIWS are tunnelled using the S102 interface. The 1xRTT MSC initiates the call with the called party number carried in the 1xRTT Origination message.
9. The E-UTRAN sends Mobility from EUTRA Command to the UE with indication that this is for enhanced 1xCS Fallback operation, 1xRTT related information, and optionally the HRPD redirection information. The 1xRTT information contains 1xRTT messages related to 1x channel assignment and cause the UE to tune to and acquire this 1x channel. This is perceived by the UE as a Handover Command message to 1xRTT. If 1xRTT CS network cannot support this CSFB request (for example due to resource availability), the DL information transfer message is sent instead, with an embedded 1x message that indicates failure to the UE.
 - For either concurrent non-optimised PS handover procedure or optimised idle-mode PS handover procedure along with enhanced CS fallback to 1xRTT, E-UTRAN may also redirect the UE to HRPD as part of this procedure. This is indicated by the HRPD redirection information in the Mobility from EUTRA Command.

10a/b/c. If PS handover procedure is not performed then E-UTRAN sends an S1 UE Context Release Request (Cause) message to the MME. Cause indicates that the S1 UE Context Release was caused by CS fallback to 1xRTT. The S1-U bearers are released and the MME starts the preservation and suspension of non-GBR bearers and the deactivation of GBR bearers towards S-GW and P-GW(s). The MME sets the UE context to suspended status.

11. UE retunes to the 1xRTT radio access network and performs 1x channel acquisition with the 1xRTT CS access (e.g. 1xRTT BSS).
12. UE and Network follow the appropriate procedure for handling non-optimised PS handover procedure or optimised idle-mode PS handover as defined in TS 23.402 [27] if performed. S1 UE Context release procedure is as specified in TS 23.402 [27] for non-optimised PS handover (clause 8.2.2) or optimised idle-mode PS handover (clause 9.4). This step occurs in parallel with step 11.

8.4.7.7.3 Test description

8.4.7.7.3.1 Pre-test conditions

System Simulator:

- Cell 1 is serving cell and Cell 19 is off.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established, pre-registered on 1xRTT (state 3C) on Cell 1 according to [18].

8.4.7.7.3.2 Test procedure sequence

Table 8.4.7.7.3.2-1 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, while row 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 8.4.7.7.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|---|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | S _{rxEVCell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | I _{or} /I _{oc} | dB | - | - | |
| | Pilot E _c /I _{or} | dB | - | - | |
| | I _{oc} | dBm/1.23 MHz | - | -100 | |
| | Pilot E _c /I _o (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 in on, with S _{ServingCell} > Thresh _{serv, low} and S _{nonServingCell, x} < Thresh _{x, low} . |
| | I _{or} /I _{oc} | dB | - | 0 | |
| | Pilot E _c /I _{or} | dB | - | -7 | |
| | I _{oc} | dBm/1.23 MHz | - | -75 | |
| | Pilot E _c /I _o (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The outgoing CS call is originated at the UE through MMI or AT command. | | | | |
| 2 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 3 | SS adjusts cell levels according to row T1 of Table 8.4.7.3.2-1. | - | - | - | - |
| 4 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to setup inter RAT measurement on Cell 19. | <-- | <i>RRCConnectionReconfiguration</i> | | |
| 5 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRCConnectionReconfigurationComplete</i> | | |
| 6 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 for Cell 19. | --> | <i>MeasurementReport</i> | | |
| 7 | The SS transmits a <i>HandoverFromEUTRANPreparationRequest</i> on Cell 1. | <-- | <i>HandoverFromEUTRANPreparationRequest</i> | | |
| 8 | Check: Does the UE transmit a tunnelled <i>1xRTT GCSNA Encapsulated Origination</i> message contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 2 | P |
| - | The following messages are to be observed on Cell 19 unless explicitly stated otherwise. | - | - | - | - |
| 9 | The SS transmits a tunnelled <i>1xRTT GCSNA Encapsulated ECAM</i> message contained in a <i>MobilityFromEUTRANCommand</i> on Cell 1 to order the UE to perform inter RAT to Cell 19. | <-- | <i>MobilityFromEUTRANCommand</i> | | |
| 10 | Check: Does UE tunes to the 1XRTT and pilots specified in the ECAM, and proceeds to send the ORM on Cell 19? | --> | <i>Origination</i> | 3 | P |
| 11 | The SS transmits an <i>Extended Channel Assignment</i> message on Cell 19. | <-- | <i>Extended Channel Assignment</i> | | |
| 12 | After the SS detects that Traffic Channel Initialization is successful, it transmits an <i>Acknowledgement Order</i> message on Cell 19. | <-- | <i>Acknowledgement Order</i> | | |
| 13 | The SS transmits a <i>Service Connect</i> message on Cell 19. | <-- | <i>Service Connect</i> | | |
| 14 | The UE transmits a <i>Service Connect Completion</i> message on Cell 19. | --> | <i>Service Connect Completion</i> | | |

8.4.7.7.3.3 Specific message contents

Table 8.4.7.7.3.3-1: *ULInformationTransfer* (Step 2, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|--|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.7.3.3-2 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.7.3.3-2: *EXTENDED SERVICE REQUEST* (Step 2, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0000'B | mobile originating CS fallback or 1xCS fallback | |
| CSFB response | Not present | | |

Table 8.4.7.7.3.3-3: *RRCConnectionReconfiguration* (Step 4, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS | | | |
|--|--|--|--|
| | | | |

Table 8.4.7.7.3.3-4: *MeasConfig* (Step 4, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| measObject[1] | MeasObjectCDMA2000-GENERIC | | |
| measObjectId[2] | IdMeasObject-f1 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT-B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigEUTRA | Not present | | |
| quantityConfigUTRA | Not present | | |
| quantityConfigGERAN | Not present | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotPnPhaseAndPilotStrength | | |
| } | | | |
| } | | | |
| measGapConfig CHOICE { | | | |
| setup SEQUENCE { | | | |
| gapOffset CHOICE { | | | |
| gp1 | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.7.3.3-5: *MeasObjectCDMA2000-GENERIC* (Step 4, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | Type1XR TT | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f17 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE {} | Cell 19 | | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.7.3.3-6: *MeasurementReport* (Step 6, Table 8.4.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | FALSE | | |
| measResultListCDMA2000 ::=SEQUENCE | 1 entry | | |
| (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 19 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotPnPhase | (0..32767) | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.3.3-7: *HandoverFromEUTRAPreparationRequest* (Step 7, Table 8.4.7.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Rand | Set by SS | Random Challenge Data as broadcast on Cell 19 | |
| mobilityParameters | Set according to 36.508 Table 4.5.2C.4-6 | CDMA2000Parameters | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.7.3.3-8: ULHandoverPreparationTransfer (Step 8, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|--------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Meid | UE's meid | | |
| dedicatedInfo | Set according to Table 8.4.7.7.3.3-9 | 1xRTT GCSNA Encapsulated Origination message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.3.3-9: 1xRTT GCSNA Encapsulated Origination (Step 8, Table 8.4.7.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-------------------------------------|--|---------------------------------------|--------------------------------------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by UE | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000100'B | Origination message | this value shall be verified by TTCN |
| NumTLACHeaderRecords | '0001'B | | |
| TLACHeaderRecordType | '0000'B | | |
| TLACHeaderRecordLength | 4 bits, Set by UE | | |
| MSID_TYPE | 3 bits, Set by UE | Should be matched with PREF_MSID_TYPE | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| Reserved | '0000000'B | | |
| 1xL3PDULength | 16 bits, Set by UE | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHARi | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH Capability Type-specific fields | Variable | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |

| | | | |
|--------------------|------|--|--|
| REV_FCH_GATING_REQ | '0'B | | |
|--------------------|------|--|--|

Table 8.4.7.7.3.3-10: MobilityFromEUTRACommand (Step 9, Table 8.4.7.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-6 | | | |
|---|---------------------------------------|---------------------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r9 SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE{ | | | |
| e-CSFB-r9 SEQUENCE { | | | |
| | | | |
| messageContCDMA2000-1XRTT-r9 | Set according to Table 8.4.7.7.3.3-11 | 1xRTT GCSNA Encapsulated ECAM message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.7.3.3-11: 1xRTT GCSNA Encapsulated ECAM message (Step 9, Table 8.4.7.7.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------------|-------------------------------|-------------------------------------|-----------|
| MessageID | '00000001'B | | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00001001'B | | |
| MsgType | '00010101'B | Extended Channel Assignment Message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| ASSIGN_MODE | '001'B | | |
| RESPOND | '1'B | | |
| FREQ_INCL | '1'B | | |
| BAND_CLASS | 11 bits, Frequency under test | | |
| CDMA_FREQ | '00000110'B | | |
| NUM_PILOTS | 6 bits, Set by SS | | |
| PILOT_PN | 9 bits, Set by SS | | |

Table 8.4.7.3.3-12: 1xRTT Origination (step 10, Table 8.4.7.3.2-2)

| Field | Value/remark | Comment | Condition |
|-----------------------|--|---------------------|--------------------------------------|
| PD | '00'B | | |
| MSG_ID | '000100'B | Origination Message | this value shall be verified by TTCN |
| LAC Length Field | 5 bits, Set by UE | | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| VALID_ACK | '0'B | | |
| ACK_TYPE | '010'B | | |
| MSID_TYPE | 3 bits, Set by UE | | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| LAC Padding Field | 0 to 7, Set by UE | | |
| ACTIVE_PILOT_STRENGTH | 6 bits, set by UE | | |
| FIRST_IS_ACTIVE | 1 bit, set by UE | | |
| FIRST_IS_PTA | 1 bit, set by UE | | |
| NUM_ADD_PILOTS | '0'B | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, Any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHARi | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH_FRAME_SIZE | '0'B | | |
| FOR_FCH_LEN | 3 bits, Set by UE | | |
| FOR_FCH_RC_MAP | Variable, Set by UE | | |
| REV_FCH_LEN | 3 bits, Set by UE | | |
| REV_FCH_RC_MAP | Variable, Set by UE | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.7.3.3-13: Extended Channel Assignment (step 11, Table 8.4.7.7.3.2-2)

| Field | Value/remark | Comment | Condition |
|---------------------|-----------------------|-------------------------------------|-----------|
| MSG_TYPE | '010101'B | Extended Channel Assignment Message | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '0'B | | |
| VALID_ACK | '1'B | | |
| ADDR_TYPE | 3 bits, Set by UE | | |
| ADDR_LEN | 4 bits, Set by UE | | |
| ADDRESS | Variable, Set by UE | | |
| RESERVED_1 | '0'B | | |
| ADD_RECORD_LEN | 8 bits, Set by UE | | |
| ASSIGN_MODE | '100'B | Traffic Channel Assignment | |
| RESERVED_2 | '00000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| BYPASS_ALERT_ANSWER | '1'B | | |
| GRANTED_MODE | '10'B | | |
| DEFAULT_CONFIG | '100'B | | |
| FOR_RC | '00011'B | | |
| REV_RC | '00011'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| ENCRYPT_MODE | '00'B | | |
| FPC_SUBCHAN_GAIN | '00001'B | | |
| RLGAIN_ADJ | 0000'B | | |
| NUM_PILOTS | '000'B | | |
| CH_IND | '01'B | | |
| CH_RECORD_LEN | 5 bits, Set by SS | | |
| CH_RECORD_FIELDS | Variable, Set by SS | | |
| REV_FCH_GATING_MODE | '0'B | | |
| RESERVED | 0 – 7 bits, Set by UE | | |
| PDU_PADDING | 0 – 7 bits, Set by UE | | |

Table 8.4.7.7.3.3-14: Acknowledgment Order (Step 12, Table 8.4.7.7.3.2-2)

| Field | Value/remark | Comment | Condition |
|------------|-------------------|-----------------------------------|-----------|
| MSG_TYPE | '00000001'B | Order Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| ORDER | '010000'B | Base Station Acknowledgment Order | |
| ORDQ | '00000000'B | | |

Table 8.4.7.7.3.3-15: Service Connect (Step 13, Table 8.4.7.7.3.2-2)

| Field | Value/remark | Comment | Condition |
|----------------------|---------------------|-------------------------|-----------|
| MSG_TYPE | '00010100'B | Service Connect Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| SERV_CON_SEQ | Set by SS | | |
| RESERVED | '00000'B | | |
| RECORD_TYPE | '00000111'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| RECORD_TYPE | '00010011'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| PDU_PADDING | 0-7 bits, Set by SS | | |

Table 8.4.7.7.3.3-16: Service Connect Completion (step 14, Table 8.4.7.7.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|---|------------------------------------|--------------------------------------|
| MSG_TYPE | '00001110'B | Service Connect Completion Message | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| SERV_CON_SEQ | Same value as SERV_CON_SEQ received in Service Connect Message (Table 8.4.7.7.3.3-15) | | |
| PDU_PADDING | 0-7 bits, Set by UE | | |

8.4.7.8 Pre-registration at 1xRTT and inter-RAT Handover / Enhanced CS fallback from E-UTRA RRC_CONNECTED to 1xRTT / ECAM-based MT call

8.4.7.8.1 Test Purpose (TP)

(1)

with { UE in E-UTRA RRC_CONNECTED state having completed the 1xRTT CS pre-registration procedure and having received a *DLInformationTransfer* message containing a *1xRTT GCSNA Encapsulated Paging* message }

ensure that {

when { UE accepts CS paging for the CS Fallback to 1xRTT }

then { UE transmits an *ULInformationTransfer* message containing an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" }

}

(2)

with { UE having transmitted an *ULInformationTransfer* message containing an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" in response to a *1xRTT CS Paging* message }

ensure that {

when { UE receives *HandoverFromEUTRAPreparationRequest* message with *cdma2000-type* set to 'type1XRTT' }

then { UE transmits an *ULHandoverPreparationTransfer* message containing a tunnelled *1xRTT GCSNA Encapsulated Page Response* message }

}

(3)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a MobilityFromEUTRACommand message containing a tunnelled 1xRTT GCSNA Encapsulated ECAM message }
  then { UE tunes to the 1X channel and pilots specified in the ECAM, and proceeds to send the Page Response message over the target 1xRTT cell }
}
    
```

8.4.7.8.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3a.4.

[TS 23.272, clause B.2.3a.4]

The following figure describes the mobile originating call procedures for the enhanced CS Fallback to 1xRTT with concurrent non-optimised PS handover or optimised idle-mode PS handover, or without concurrent PS handover, in the normal case. Clause B.2.3b describes the procedure when the procedure is rejected by the MME.

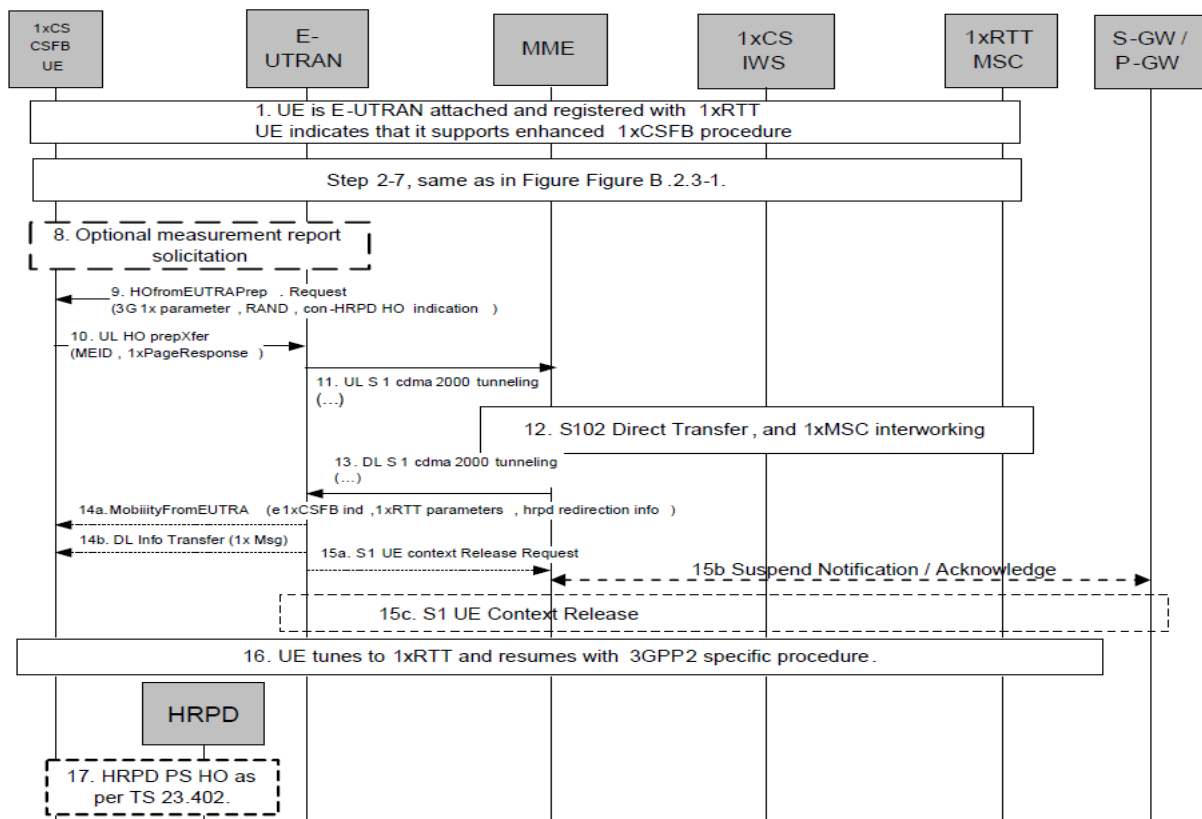


Figure B.2.3a.4-1: Enhanced CS fallback to 1xRTT MT Call with no PS handover, or with concurrent non-optimised PS handover or optimised idle-mode PS handover

UE is E-UTRAN attached and pre-registered with 1xRTT CS as defined in clause B.2.1.1 with enhanced CS fallback to 1xRTT capability indication to E-UTRAN. The UE may also indicate that it supports concurrent 1xRTT and HRPD capability. The UE may also be pre-registered with HRPD access using procedures defined in TS 23.402 [27], clause 9.3.1. The UE may also indicate support of enhanced CS fallback to 1xRTT for dual receiver/transmitter configuration to E-UTRAN.

2.-7. Same as step 2-7 in figure B.2.3-1.

If priority indication is included in the S1AP UE Context Setup or modification message from the MME to the E-UTRAN, the E-UTRAN shall not initiate enhanced 1xCSFB with concurrent optimized PS handover to HRPD access.

8.-17. Same as steps 5 – 12 of Figure B.2.3a.2-1, with the modifications that the 1x message in step 7 of Figure B.2.3a.2-1 provided by the UE to the E-UTRAN is a 1xPage Response message and 1x messages in step 9a of Figure B.2.3a.2-1 (step 14a of Figure B.2.3a.4-1) provided by the E-UTRAN to UE may also contain Alert With Information message to provide caller line Identification and alerting trigger with 1x channel assignment message.

8.4.7.8.3 Test description

8.4.7.8.3.1 Pre-test conditions

System Simulator:

- Cell 1 is serving cell and Cell 19 is off.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established, pre-registered on 1xRTT (state 3C) on Cell 1 according to [18].

8.4.7.8.3.2 Test procedure sequence

Table 8.4.7.8.3.2-1 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, while row 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 8.4.7.8.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|---|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | S _{rxEVCell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | I _{or} /I _{oc} | dB | - | - | |
| | Pilot E _c /I _{or} | dB | - | - | |
| | I _{oc} | dBm/1.23 MHz | - | -100 | |
| | Pilot E _c /I _o (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 is on, with S _{ServingCell} > Thresh _{servi_{ng}.low} and S _{NonServingCell, x} < Thresh _{x,low} . |
| | I _{or} /I _{oc} | dB | - | 0 | |
| | Pilot E _c /I _{or} | dB | - | -7 | |
| | I _{oc} | dBm/1.23 MHz | - | -75 | |
| | Pilot E _c /I _o (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.8.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | SS adjusts the cell power levels according to "T1" in Table 8.4.7.10.3.2-1. | - | | - | - |
| 2 | Does the UE receive a tunnelled <i>1xRTT GCSNA Encapsulated General Page</i> message on Cell 1? | <-- | <i>DLInformationTransfer</i> | - | - |
| 3 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile terminating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 4 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to setup inter RAT measurement on Cell 19. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 5 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 6 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 for Cell 19. | --> | <i>MeasurementReport</i> | - | - |
| 7 | The SS transmits a <i>HandoverFromEUTRAPreparationRequest</i> on Cell 1. | <-- | <i>HandoverFromEUTRAPreparationRequest</i> | - | - |
| 8 | Check: Does the UE transmit a tunnelled <i>1xRTT GCSNA Encapsulated Page Response</i> message contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 2 | P |
| 9 | The SS transmits a tunnelled <i>1xRTT GCSNA Encapsulated ECAM</i> message contained in a <i>MobilityFromEUTRACommand</i> on Cell1 to order the UE to perform inter RAT to Cell 19. | <-- | <i>MobilityFromEUTRACommand</i> | - | - |
| 10 | Check: Does UE send the <i>Page Response</i> on Cell 19? | --> | <i>Page Response</i> | 3 | P |
| 11 | The SS transmits an <i>Extended Channel Assignment</i> message on Cell 19. | <-- | <i>Extended Channel Assignment</i> | - | - |
| 12 | After the SS detects that Traffic Channel Initialization is successful, it transmits an <i>Acknowledgement Order</i> message on Cell 19. | <-- | <i>Acknowledgement Order</i> | | |
| 13 | The SS transmits a <i>Service Connect</i> message on Cell 19. | <-- | <i>Service Connect</i> | | |
| 14 | The UE transmits a <i>Service Connect Completion</i> message on Cell 19. | --> | <i>Service Connect Completion</i> | | |

8.4.7.8.3.3 Specific message contents

Table 8.4.7.8.3.3-1: DLInformationTransfer (Step 2, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-3 | | | |
|---------------------------------------|--------------------------------------|---------------------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| DLInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| dlInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoCDMA2000-1XRTT | Set according to Table 8.4.7.8.3.3-2 | 1xRTT GCSNA Encapsulated General Page | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3.3-2: 1xRTT GCSNA Encapsulated General Page (Step 2, Table 8.4.7.8.3.2-2)

| Field | Value/remark | Comment | Condition |
|-----------------------------|--------------------|-------------------------------|-----------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | Set by UE | | |
| MsgType | '00010001'B | General Page Message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| PDU | | 1xL3 PDU | |
| Service_Option | 16 bits, Set by SS | | |

Table 8.4.7.8.3.3-3: ULInformationTransfer (Step 3, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|--|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.8.3.3-4 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3.3-4: EXTENDED SERVICE REQUEST (Step 3, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0001'B | mobile terminating CS fallback or 1xCS fallback | |
| CSFB response | '001'B | CS fallback accepted by the UE | |

Table 8.4.7.8.3.3-5: RRCConnectionReconfiguration (Step 4, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|
|--|

Table 8.4.7.8.3.3-6: MeasConfig (Step 4, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| measObject[1] | MeasObjectCDMA2000-GENERIC | | |
| measObjectId[2] | IdMeasObject-f1 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT-B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f17 | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigEUTRA | Not present | | |
| quantityConfigUTRA | Not present | | |
| quantityConfigGERAN | Not present | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotPnPhaseAndPilotStrength | | |
| } | | | |
| } | | | |
| measGapConfig CHOICE { | | | |
| setup SEQUENCE { | | | |
| gapOffset CHOICE { | | | |
| gp1 | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3-7: *MeasObjectCDMA2000-GENERIC* (Step 4, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f17 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE { | Cell 19 | | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.7.8.3.3-8: *MeasurementReport* (Step 6, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | FALSE | | |
| measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 19 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotPnPhase | (0..32767) | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3.3-9: HandoverFromEUTRAPreparationRequest (Step 7, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Rand | Set by SS | Random Challenge Data as broadcast on Cell 19 | |
| mobilityParameters | Set according to 36.508 Table 4.5.2C.4-6 | CDMA2000Parameters | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3.3-10: ULHandoverPreparationTransfer (Step 8, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Meid | UE's meid | | |
| dedicatedInfo | Set according to Table 8.4.7.8.3.3-11 | 1xRTT GCSNA Encapsulated Page Response message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3.3-11: 1xRTT GCSNA Encapsulated Page Response (Step 8, Table 8.4.7.8.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-------------------------------------|---------------------|---------------------------------------|--------------------------------------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | 6 bits, Set by UE | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000101'B | Page Response message | this value shall be verified by TTCN |
| NumTLACHeaderRecords | '0001'B | | |
| TLACHeaderRecordType | '0000'B | | |
| TLACHeaderRecordLength | 8 bits, Set by UE | | |
| MSID_TYPE | 3 bits, Set by UE | Should be matched with PREF_MSID_TYPE | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| Reserved | '0000000'B | | |
| 1xL3PDULength | 16 bits, Set by UE | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SERVICE_OPTION | 16 bits, Set by UE | | |
| PM | '0'B | | |
| NAR_AN_CAP | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| NUM_ALT_SO | '000'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '0'B | | |
| OTD_SUPPORTED | '0000'B | | |
| QPCH_SUPPORTED | '0'B | | |
| ENHANCED_RC | '0'B | | |
| FOR_RC_PREF | '0000'B | | |
| REV_RC_PREF | '0'B | | |
| FCH_SUPPORTED | '0'B | | |
| FCH Capability Type-specific fields | Variable | | |
| DCCH_SUPPORTED | '1'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.8.3.3-12: MobilityFromEUTRACommand (Step 9, Table 8.4.7.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-6 | | | |
|---|---------------------------------------|---------------------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityFromEUTRACommand ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| mobilityFromEUTRACommand-r9 SEQUENCE { | | | |
| csFallbackIndicator | False | | |
| purpose CHOICE{ | | | |
| e-CSFB-r9 SEQUENCE { | | | |
| messageContCDMA2000-1XRTT-r9 | Set according to Table 8.4.7.8.3.3-13 | 1xRTT GCSNA Encapsulated ECAM message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.8.3.3-13: 1xRTT GCSNA Encapsulated ECAM message (Step 9, Table 8.4.7.8.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------------|-------------------------------|-------------------------------------|-----------|
| MessageID | '00000001'B | | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00001001'B | | |
| MsgType | '00010101'B | Extended Channel Assignment Message | |
| NumTLACHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 16 bits, Set by SS | | |
| ASSIGN_MODE | '001'B | | |
| RESPOND | '1'B | | |
| FREQ_INCL | '1'B | | |
| BAND_CLASS | 11 bits, Frequency under test | | |
| CDMA_FREQ | '00000110'B | | |
| NUM_PILOTS | 6 bits, Set by SS | | |
| PILOT_PN | 9 bits, Set by SS | | |

Table 8.4.7.8.3.3-14: *Page Response* (step 10, Table 8.4.7.8.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------|---------------------|-----------------------|--------------------------------------|
| PD | '01'B | | |
| MSG_ID | '000101'B | Page Response Message | this value shall be verified by TTCN |
| LAC Length Field | 5 bits, Set by UE | | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| VALID_ACK | '1'B | | |
| ACK_TYPE | '010'B | | |
| MSID_TYPE | 3 bits, Set by UE | | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| LAC Padding Field | 0 to 7, Set by UE | | |
| ACTIVE_PILOT_STRENGTH | 6 bits, set by UE | | |
| FIRST_IS_ACTIVE | 1 bit, set by UE | | |
| FIRST_IS_PTA | 1 bit, set by UE | | |
| NUM_ADD_PILOTS | '0'B | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SERVICE_OPTION | 16 bits, Set by UE | | |
| PM | '0'B | | |
| NAAR_AN_CAP | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH_FRAME_SIZE | '0'B | | |
| FOR_FCH_LEN | 3 bits, Set by UE | | |
| FOR_FCH_RC_MAP | Variable, Set by UE | | |
| REV_FCH_LEN | 3 bits, Set by UE | | |
| REV_FCH_RC_MAP | Variable, Set by UE | | |
| DCCH_SUPPORTED | '1'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.8.3.3-15: Extended Channel Assignment (step 11, Table 8.4.7.8.3.2-2)

| Field | Value/remark | Comment | Condition |
|---------------------|-----------------------|-------------------------------------|-----------|
| MSG_TYPE | '00010101'B | Extended Channel Assignment Message | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '0'B | | |
| VALID_ACK | '1'B | | |
| ADDR_TYPE | 3 bits, Set by UE | | |
| ADDR_LEN | 4 bits, Set by UE | | |
| ADDRESS | Variable, Set by UE | | |
| RESERVED_1 | '0'B | | |
| ADD_RECORD_LEN | 8 bits, Set by UE | | |
| ASSIGN_MODE | '100'B | Traffic Channel Assignment | |
| RESERVED_2 | '00000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| BYPASS_ALERT_ANSWER | '1'B | | |
| GRANTED_MODE | '10'B | | |
| DEFAULT_CONFIG | '100'B | | |
| FOR_RC | '00011'B | | |
| REV_RC | '00011'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| ENCRYPT_MODE | '00'B | | |
| FPC_SUBCHAN_GAIN | '00001'B | | |
| RLGAIN_ADJ | 0000'B | | |
| NUM_PILOTS | '000'B | | |
| CH_IND | '01'B | | |
| CH_RECORD_LEN | 5 bits, Set by SS | | |
| CH_RECORD_FIELDS | Variable, Set by SS | | |
| REV_FCH_GATING_MODE | '0'B | | |
| RESERVED | 0 – 7 bits, Set by UE | | |
| PDU_PADDING | 0 – 7 bits, Set by UE | | |

Table 8.4.7.8.3.3-16: Acknowledgment Order (step 12, Table 8.4.7.8.3.2-2)

| Field | Value/remark | Comment | Condition |
|------------|-------------------|-----------------------------------|-----------|
| MSG_TYPE | '00000001'B | Order Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| ORDER | '010000'B | Base Station Acknowledgment Order | |
| ORDQ | '00000000'B | | |

Table 8.4.7.8.3.3-17: Service Connect (step 13, Table 8.4.7.8.3.2-2)

| Field | Value/remark | Comment | Condition |
|----------------------|---------------------|-------------------------|-----------|
| MSG_TYPE | '00010100'B | Service Connect Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | 1'B | | |
| ENCRYPTION | '00'B | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| SERV_CON_SEQ | Set by SS | | |
| RESERVED | '00000'B | | |
| RECORD_TYPE | '00000111'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| RECORD_TYPE | '00010011'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| PDU_PADDING | 0-7 bits, Set by SS | | |

Table 8.4.7.8.3.3-18: Service Connect Completion (step 14, Table 8.4.7.8.3.2-2)

| Field | Value/remark | Comment | Condition |
|--------------|---|------------------------------------|--------------------------------------|
| MSG_TYPE | '00001110'B | Service Connect Completion Message | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| SERV_CON_SEQ | Same value as SERV_CON_SEQ received in Service Connect Message (Table 8.4.7.8.3.3-17) | | |
| PDU_PADDING | 0-7 bits, Set by UE | | |

8.4.7.9 Pre-registration at 1xRTT and inter-RAT Handover / Enhanced CS fallback from E-UTRA RRC_CONNECTED to 1xRTT / Extended Service Reject / MO call

8.4.7.9.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state and having completed the 1xRTT CS pre-registration procedure
}
ensure that {
  when { a voice call is originated at the UE }
  then { UE transmits an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile
originating CS fallback or 1xCS fallback" }
}

```

(2)

```

with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST
message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
ensure that {
  when { UE receives SERVICE REJECT message with cause_value = EMM cause #22 in a
DLInformationTransfer message}
  then { UE tunes to 1xRTT cell, transmits a 1xRTT Origination message on the 1xRTT cell and
establishes the call}
}

```

8.4.7.9.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3b.2.

[TS 23.272, clause B.2.3b.2]

The following figure describes the mobile originating or mobile terminating call rejected by the MME procedures for the enhanced CS Fallback to 1xRTT.

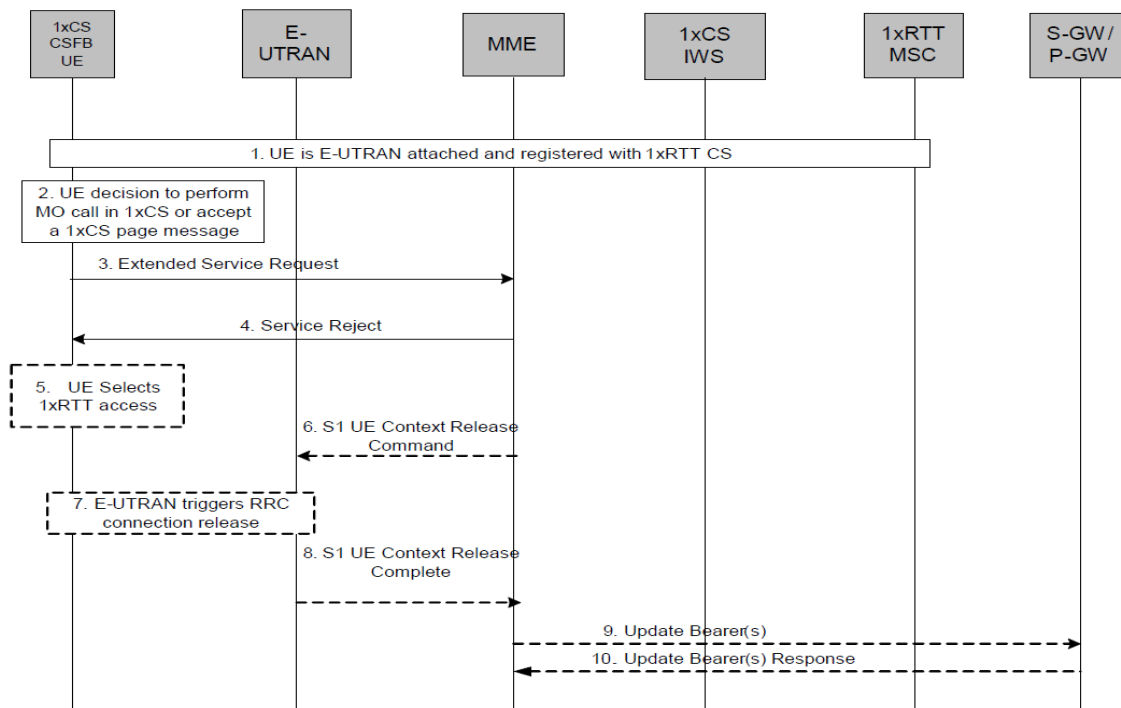


Figure B.2.3b-1: 1xCSFB MO or MT call, rejected by MME

1. UE is E-UTRAN attached and pre-registered with 1xRTT CS as defined in clause B.2.1.1.
2. UE makes a decision to perform a mobile originated CS call or accepts CS paging for the CS Fallback to 1xRTT (Step 6a, Clause 5.2.3).
3. UE sends an Extended Service Request for mobile originating/mobile terminating 1xCS fallback to the MME.
4. If the MME decides to reject the Extended Service Request, the MME sends a Service Reject message to the UE. Steps 5 – 10 are executed when Service Reject is sent with a reason code which results in the UE selecting 1xRTT access, as specified in TS 24.301 [34].
5. The UE selects 1xRTT access without waiting for RRC Release.
6. The MME releases S1 by sending the S1 UE Context Release Command (Cause) message to the eNo deB. Cause value indicates that the release is triggered by CS Fallback procedure.
7. If the RRC connection is not already released, the E-UTRAN sends a RRC Connection Release message to the UE.
8. The E-UTRAN confirms the S1 Release by returning an S1 UE Context Release Complete message to the MME.
9. Depending on the reason for rejection, MME may start Suspend Notification:
 - - Suspend Notification: The S1-U bearers are released and the MME starts the preservation and suspension of non-GBR bearers and the deactivation of GBR bearers towards S-GW and P-GW(s).

- S-GW and P-GW(s) acknowledges the bearer updates Suspend Notification and marks the UE as suspended. The P-GW discards downlink data if the UE is marked as suspended.

8.4.7.9.3 Test description

8.4.7.9.3.1 Pre-test conditions

System Simulator:

- Cell 1 is serving cell and Cell 19 is off.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established, pre-registered on 1xRTT (state 3C) on Cell 1 according to [18].

8.4.7.9.3.2 Test procedure sequence

Table 8.4.7.9.3.2-1 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, while row 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 8.4.7.9.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|-----------------------|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Srxlev _{Cell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | lor/loc | dB | - | - | |
| | Pilot Ec/lor | dB | - | - | |
| | loc | dBm/1.23 MHz | - | -100 | |
| | Pilot Ec/lo (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 in on, with S _{ServingCell} > Thresh _{serv, low} and S _{nonServingCell, x} < Thresh _{x, low} . |
| | lor/loc | dB | - | 0 | |
| | Pilot Ec/lor | dB | - | -7 | |
| | loc | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/lo (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.9.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|-----------------------------------|----|---------|
| | | U – S | Message | | |
| 1 | SS adjusts cell levels according to row T1 of table 8.4.7.9.3.2-1 | | | | |
| 2 | A voice call is originated at the UE | - | - | - | - |
| 3 | Check: Does the UE transmit an <i>ULInformationTransfer</i> message containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 4 | SS sends a SERVICE REJECT message with the cause_value = EMM cause #22 in a <i>DLInformationTransfer</i> message on Cell 1 | <-- | <i>DLInformationTransfer</i> | - | - |
| - | The following messages are to be observed on Cell 19 unless explicitly stated otherwise | - | - | - | - |
| 5 | Check: Does the UE transmit an <i>Origination</i> message? | --> | <i>Origination</i> | 2 | P |
| 6 | The SS transmits an <i>Extended Channel Assignment</i> message. | <-- | <i>ExtendedChannelAssignment</i> | - | -- |
| 7 | After the SS detects that Traffic Channel Initialization is successful, it transmits an <i>Acknowledgement Order</i> message. | <-- | <i>Acknowledgement Order</i> | - | - |
| 8 | The SS transmits a <i>Service Connect</i> message. | <-- | <i>Service Connect</i> | - | - |
| 9 | Check: Does the UE transmits a <i>Service Connect Completion</i> message on Cell 19? | --> | <i>Service Connect Completion</i> | 2 | P |

8.4.7.9.3.3 Specific message contents

Table 8.4.7.9.3.3-1: *ULInformationTransfer* (Step 3, Table 8.4.7.9.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|---|--------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>ULInformationTransfer</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.9.3.3-2 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.9.3.3-2: *Extended Service Request* (Step 3, Table 8.4.7.9.3.2-2)

| Derivation Path: 36.508 Table 4.7.2-14A | | | |
|---|--------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Service type | '0000'B | mobile originating CS fallback or 1xCS fallback | |
| CSFB response | Not present | | |

Table 8.4.7.9.3.3-3: DLInformationTransfer (Step 4, Table 8.4.7.9.3.2-2)

| Derivation Path: 36.331 clause 6.2.2 | | | |
|--------------------------------------|--------------------------------------|----------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULInformationTransfer ::= SEQUENCE { | | | |
| Rrc-TransactionIdentifier | RRC-TransactionIdentifier-DL | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.9.3.3-4 | Service Reject | |
| } | | | |
| nonCriticalExtesion SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.9.3.3-4: Service Reject (Step 4, Table 8.4.7.9.3.2-2)

| Derivation Path: 24.301 clause 8.2.24 | | | |
|---------------------------------------|---------------|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| Protocol discriminator | EMM | | |
| Security header type | '0000'B | Plain NAS message, not security protected | |
| Service reject message identity | '0100 1110'B | Service Reject | |
| EMM cause | EMM cause #22 | | |
| T3442 value | Not present | | |

Table 8.4.7.9.3.3-6: *Origination* (step 5, Table 8.4.7.9.2-2)

| Field | Value/remark | Comment | Condition |
|-----------------------|--|---------------------|--------------------------------------|
| PD | '00'B | | |
| MSG_ID | '000100'B | Origination Message | this value shall be verified by TTCN |
| LAC Length Field | 5 bits, Set by UE | | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| VALID_ACK | '0'B | | |
| ACK_TYPE | '010'B | | |
| MSID_TYPE | 3 bits, Set by UE | | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| LAC Padding Field | 0 to 7, Set by UE | | |
| ACTIVE_PILOT_STRENGTH | 6 bits, set by UE | | |
| FIRST_IS_ACTIVE | 1 bit, set by UE | | |
| FIRST_IS_PTA | 1 bit, set by UE | | |
| NUM_ADD_PILOTS | '0'B | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, Any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHAR _i | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH_FRAME_SIZE | '0'B | | |
| FOR_FCH_LEN | 3 bits, Set by UE | | |
| FOR_FCH_RC_MAP | Variable, Set by UE | | |
| REV_FCH_LEN | 3 bits, Set by UE | | |
| REV_FCH_RC_MAP | Variable, Set by UE | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |
| REV_FCH_GATING_REQ | '0'B | | |

Table 8.4.7.9.3.3-7: *Extended Channel Assignment* (step 6, Table 8.4.7.9.2-2)

| Field | Value/remark | Comment | Condition |
|---------------------|-----------------------|-------------------------------------|-----------|
| MSG_TYPE | '010101'B | Extended Channel Assignment Message | |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '0'B | | |
| VALID_ACK | '1'B | | |
| ADDR_TYPE | 3 bits, Set by UE | | |
| ADDR_LEN | 4 bits, Set by UE | | |
| ADDRESS | Variable, Set by UE | | |
| RESERVED_1 | '0'B | | |
| ADD_RECORD_LEN | 8 bits, Set by UE | | |
| ASSIGN_MODE | '100'B | Traffic Channel Assignment | |
| RESERVED_2 | '00000'B | | |
| BAND_CLASS | 5 bits, Set by SS | | |
| CDMA_FREQ | 11 bits, Set by SS | | |
| BYPASS_ALERT_ANSWER | '1'B | | |
| GRANTED_MODE | '10'B | | |
| DEFAULT_CONFIG | '100'B | | |
| FOR_RC | '00011'B | | |
| REV_RC | '00011'B | | |
| FRAME_OFFSET | 4 bits, Set by SS | | |
| ENCRYPT_MODE | '00'B | | |
| FPC_SUBCHAN_GAIN | '00001'B | | |
| RLGAIN_ADJ | 0000'B | | |
| NUM_PILOTS | '000'B | | |
| CH_IND | '01'B | | |
| CH_RECORD_LEN | 5 bits, Set by SS | | |
| CH_RECORD_FIELDS | Variable, Set by SS | | |
| REV_FCH_GATING_MODE | '0'B | | |
| RESERVED | 0 – 7 bits, Set by UE | | |
| PDU_PADDING | 0 – 7 bits, Set by UE | | |

Table 8.4.7.9.3.3-8: *Acknowledgment Order* (step 7, Table 8.4.7.9.2-2)

| Field | Value/remark | Comment | Condition |
|------------|-------------------|-----------------------------------|-----------|
| MSG_TYPE | '00000001'B | Order Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| ORDER | '010000'B | Base Station Acknowledgment Order | |
| ORDQ | '00000000'B | | |

Table 8.4.7.9.3.3-9: Service Connect (step 8, Table 8.4.7.9.2-2)

| Field | Value/remark | Comment | Condition |
|----------------------|---------------------|-------------------------|-----------|
| MSG_TYPE | '00010100'B | Service Connect Message | |
| ACK_SEQ | 3 bits, Set by SS | | |
| MSG_SEQ | 3 bits, Set by SS | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| USE_TIME | '0'B | | |
| ACTION_TIME | '000000'B | | |
| SERV_CON_SEQ | Set by SS | | |
| RESERVED | '00000'B | | |
| RECORD_TYPE | '00000111'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| RECORD_TYPE | '00010011'B | | |
| RECORD_LEN | 8 bits, Set by SS | | |
| Type-specific fields | Variable, Set by SS | | |
| PDU_PADDING | 0-7 bits, Set by SS | | |

Table 8.4.7.9.3.3-10: Service Connect Completion (step 9, Table 8.4.7.9.2-2)

| Information Element | Value/remark | Comment | Condition |
|---------------------|--|------------------------------------|--------------------------------------|
| MSG_TYPE | '00001110'B | Service Connect Completion Message | this value shall be verified by TTCN |
| ACK_SEQ | 3 bits, Set by UE | | |
| MSG_SEQ | 3 bits, Set by UE | | |
| ACK_REQ | '1'B | | |
| ENCRYPTION | '00'B | | |
| RESERVED | '0'B | | |
| SERV_CON_SEQ | Same value as SERV_CON_SEQ received in Service Connect Message (Table 8.4.7.9.3.3-9) | | |
| PDU_PADDING | 0-7 bits, Set by UE | | |

8.4.7.10 Pre-registration at 1xRTT and inter-RAT Handover / Enhanced CS fallback from E-UTRA call failure – GCSNA with Release Order

8.4.7.10.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and having completed the 1xRTT CS pre-registration procedure }
ensure that {
  when { a voice call is originated at the UE }
  then { UE transmits an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
}
```

(2)

```
with { UE having transmitted an ULInformationTransfer message containing an EXTENDED SERVICE REQUEST message with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" }
ensure that {
  when { SS transmits HandoverFromEUTRAPreparationRequest message with cdma2000-type set to 'type1XRTT' }
  then { UE transmits an ULHandoverPreparationTransfer message containing a tunnelled 1xRTT GCSNA Encapsulated Origination message }
}
```

(3)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives a DLInformationTransfer message containing a tunnelled 1xRTT GCSNA Encapsulated Release Order message }
  then { UE ends a voice call origination procedure }
}
    
```

8.4.7.10.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause B.2.3a.2.

[TS 23.272, clause B.2.3a.2]

The following figure describes the mobile originating call procedures for the enhanced CS Fallback to 1xRTT with concurrent non-optimised PS handover or optimised idle-mode PS handover, or without concurrent PS handover, in the normal case. Clause B.2.3b describes the procedure when the procedure is rejected by the MME.

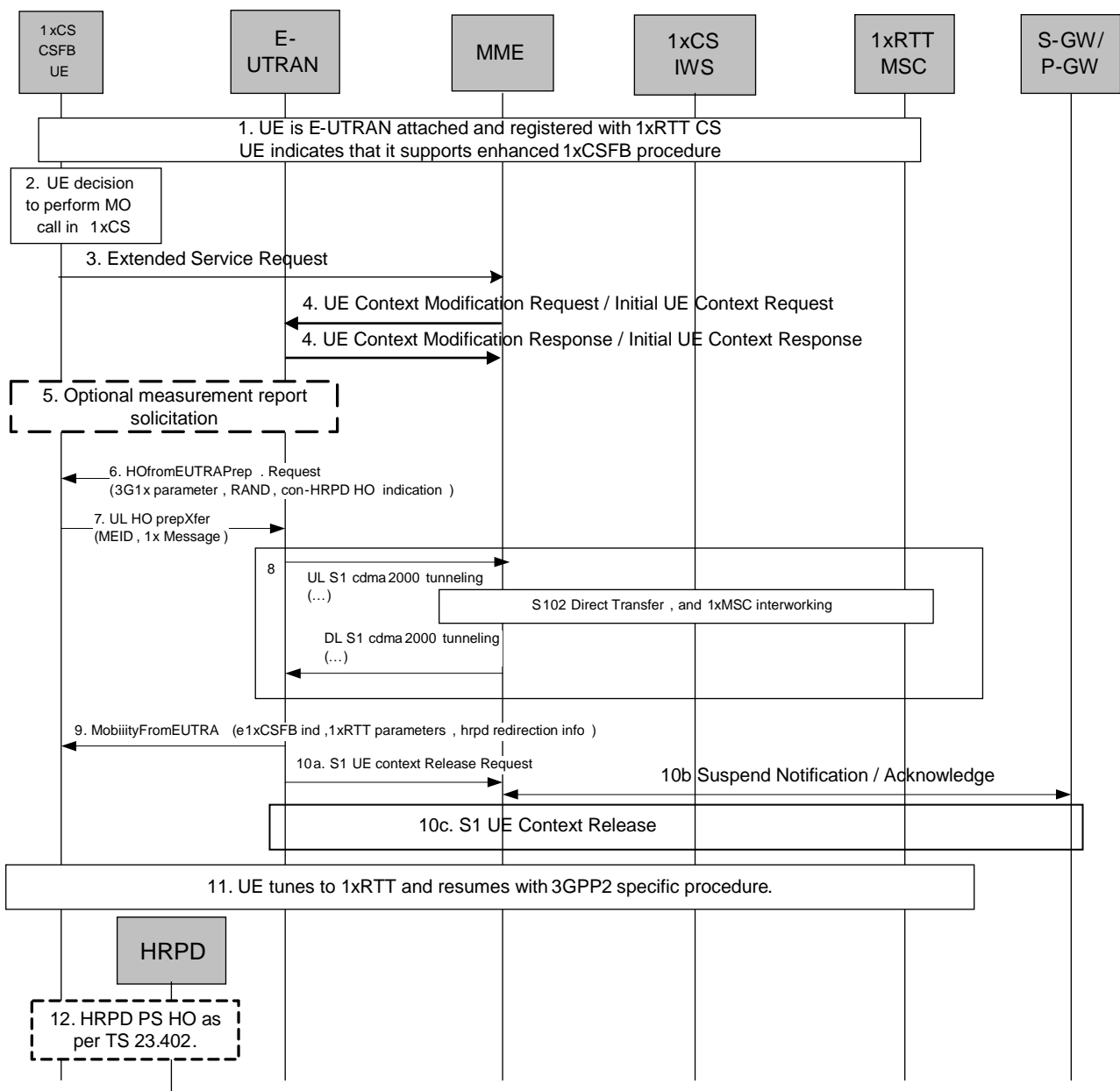


Figure B.2.3a.2-1: Enhanced CS fallback to 1xRTT MO Call with no PS handover, or with concurrent non-optimised PS handover or optimised idle-mode PS handover

1. UE is E-UTRAN attached and registered with 1xRTT CS as defined in clause B.2.1.1 with enhanced CS fallback to 1xRTT capability indication to the network. The UE may also indicate that it supports concurrent 1xRTT and HRPD capability. The UE may also be pre-registered with HRPD access using procedures defined in TS 23.402 [27], clause 9.3.1.
2. UE makes a decision to perform a mobile originated CS call.
3. UE sends an Extended Service Request (CS Fallback Indicator) to the MME.
4. For a UE in active mode, MME sends UE Context Modification Request (CS Fallback Indicator) to E-UTRAN. CS Fallback Indicator indicates to the E-UTRAN to move the UE to 1xRTT. E-UTRAN responds with UE Context Modification Response.

For a UE in idle mode, MME sends Initial UE Context Request (CS Fallback Indicator) to E-UTRAN. CS Fallback Indicator indicates to the E-UTRAN to move the UE to 1xRTT. E-UTRAN responds with Initial UE Context Response.

5. E-UTRAN may optionally solicit a 1xRTT measurement report from the UE to determine the target 1xRTT cell to which the CS Fallback will be performed.

If the network supports PS handover procedure to HRPD then E-UTRAN may optionally solicit an HRPD measurement report from the UE to determine whether the target HRPD candidates exist or not. If the network does not support PS handover procedure to HRPD or if no target HRPD candidates exist then E-UTRAN shall release the S1 UE context (see step 10a/b) after executing the enhanced CS fallback to 1xRTT procedure.

6. E-UTRAN sends a HandoverFromE-UTRANPreparation Request message to the UE to start the enhanced 1xCS fallback procedure. It includes 3G1x Overhead Parameters and RAND value. This message also includes an indication that concurrent HRPD handover preparation is not required.
7. The UE initiates signalling for establishment of the CS access leg by sending UL HandoverPreparation Transfer message which contains the 1xRTT Origination message with called party number.
8. Messages between MME and 1xIWS are tunnelled using the S102 interface. The 1xRTT MSC initiates the call with the called party number carried in the 1xRTT Origination message.
9. The E-UTRAN sends Mobility from EUTRA Command to the UE with indication that this is for enhanced 1x CS Fallback operation, 1xRTT related information, and optionally the HRPD redirection information. The 1xRTT information contains 1xRTT messages related to 1x channel assignment and cause the UE to tune to and acquire this 1x channel. This is perceived by the UE as a Handover Command message to 1xRTT. If 1xRTT CS network cannot support this CSFB request (for example due to resource availability), the DL information transfer message is sent instead, with an embedded 1x message that indicates failure to the UE.
 - For either concurrent non-optimised PS handover procedure or optimised idle-mode PS handover procedure along with enhanced CS fallback to 1xRTT, E-UTRAN may also redirect the UE to HRPD as part of this procedure. This is indicated by the HRPD redirection information in the Mobility from EUTRA Command.

10a/b/c. If PS handover procedure is not performed then E-UTRAN sends an S1 UE Context Release Request (Cause) message to the MME. Cause indicates that the S1 UE Context Release was caused by CS fallback to 1xRTT. The S1-U bearers are released and the MME starts the preservation and suspension of non-GBR bearers and the deactivation of GBR bearers towards S-GW and P-GW(s). The MME sets the UE context to suspended status.

11. UE retunes to the 1xRTT radio access network and performs 1x channel acquisition with the 1xRTT CS access (e.g. 1xRTT BSS).
12. UE and Network follow the appropriate procedure for handling non-optimised PS handover procedure or optimised idle-mode PS handover as defined in TS 23.402 [27] if performed. S1 UE Context release procedure is as specified in TS 23.402 [27] for non-optimised PS handover (clause 8.2.2) or optimised idle-mode PS handover (clause 9.4). This step occurs in parallel with step 11.

8.4.7.10.3 Test description

8.4.7.10.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 19.
- Cell 19 has a lower reselection priority than Cell 1.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established, pre-registered on 1xRTT (state 3C) on Cell 1 according to [18].

8.4.7.10.3.2 Test procedure sequence

Table 8.4.7.10.3.2-1 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, while row 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 8.4.7.10.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 19 | Remark |
|---|-----------------------|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Srxlev _{Cell 1} > 0 and Cell 19 is off such that camping on Cell 1 is guaranteed. |
| | Ior/Ioc | dB | - | - | |
| | Pilot Ec/Ior | dB | - | - | |
| | Ioc | dBm/1.23 MHz | - | - | |
| | Pilot Ec/Io (Note 1) | dB | - | - | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | Cell 19 in on, with S _{ServingCell} > Thresh _{serv, low} and S _{nonServingCell, x} < Thresh _{x, low} . |
| | Ior/Ioc | dB | - | 0 | |
| | Pilot Ec/Ior | dB | - | -7 | |
| | Ioc | dBm/1.23 MHz | - | -75 | |
| | Pilot Ec/Io (Note 1) | dB | - | -10 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | |

Table 8.4.7.10.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | A voice call is originated at the UE | - | - | - | - |
| 2 | Check: Does the UE transmit an <i>ULInformationTransfer</i> containing an EXTENDED SERVICE REQUEST with Service Type IE set to "mobile originating CS fallback or 1xCS fallback" on Cell 1? | --> | <i>ULInformationTransfer</i> | 1 | P |
| 3 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1 to setup inter RAT measurement on Cell 19. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 4 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1 to confirm the setup of inter RAT measurement. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 5 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 1 to report event B2 for Cell 19, | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 6 | The SS transmits a <i>HANDOVERFROMEUTRAPREPARATIONREQUEST</i> on Cell 1. | <-- | <i>HANDOVERFROMEUTRAPREPARATIONREQUEST</i> | - | - |
| 7 | Check: Does the UE transmit a tunnelled <i>1xRTT GCSNA Encapsulated Origination</i> message contained in an <i>ULHandoverPreparationTransfer</i> message on Cell 1? | --> | <i>ULHandoverPreparationTransfer</i> | 2 | P |
| 8 | The SS transmits a tunnelled <i>1xRTT GCSNA Encapsulated Release Order</i> message contained in a <i>DLInformationTransfer</i> message on Cell 1. | <-- | <i>DLInformationTransfer</i> | - | - |
| 9 | The SS waits 5 seconds. | | | - | - |
| 10-11 | Check: Are the steps 1 to 2 of the Test procedure (TS 36.508 6.4.2.3) successfully executed? | | | 3 | P |

8.4.7.10.3.3 Specific message contents

Table 8.4.7.10.3.3-1: *ULInformationTransfer* (Step 2, Table 8.4.7.10.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-25 | | | |
|---|---------------------------------------|--------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>ULInformationTransfer</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ulInformationTransfer-r8</i> SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | | | |
| dedicatedInfoNAS | Set according to Table 8.4.7.10.3.3-2 | EXTENDED SERVICE REQUEST | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.10.3.3-5: MeasObjectCDMA2000-GENERIC (Step 3, Table 8.4.7.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f17 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE {} | Cell 19 | | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.4.7.10.3.3-6: MeasurementReport (Step 5, Table 8.4.7.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | FALSE | | |
| measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 19 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotPnPhase | (0..32767) | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.10.3.3-7: HandoverFromEUTRA PreparationRequest (Step 6, Table 8.4.7.10.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-4 | | | |
|--|--|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| HandoverFromEUTRAPreparationRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| handoverFromEUTRAPreparationRequest-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Rand | Set by SS | Random Challenge Data as broadcast on Cell 19 | |
| mobilityParameters | Set according to 36.508 Table 4.5.2C.4-6 | CDMA2000Parameters | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.10.3.3-8: ULHandoverPreparationTransfer (Step 7, Table 8.4.7.10.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-24 | | | |
|--|---------------------------------------|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| ULHandoverPreparationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ulHandoverPreparationTransfer-r8 SEQUENCE { | | | |
| cdma2000-Type | Type1XRTT | | |
| Meid | UE's meid | | |
| dedicatedInfo | Set according to Table 8.4.7.10.3.3-9 | 1xRTT GCSNA Encapsulated Origination message | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.10.3.3-9: 1xRTT GCSNA Encapsulated Origination (Step 7, Table 8.4.7.10.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-------------------------------------|--|---------------------------------------|--------------------------------------|
| MessageID | '00000001'B | GCSNA1xCircuitService message | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by UE | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '0'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000100'B | Origination message | this value shall be verified by TTCN |
| NumTLACHaderRecords | '0001'B | | |
| TLACHaderRecordType | '0000'B | | |
| TLACHaderRecordLength | 4 bits, Set by UE | | |
| MSID_TYPE | 3 bits, Set by UE | Should be matched with PREF_MSID_TYPE | |
| MSID_LEN | 4 bits, Set by UE | | |
| MSID | Variable, Set by UE | | |
| Reserved | '0000000'B | | |
| 1xL3PDULength | 16 bits, Set by UE | | |
| MOB_TERM | '1'B | | |
| SLOT_CYCLE_INDEX | '010'B | | |
| MOB_P_REV | 8 bits, Set by UE | | |
| SCM | 8 bits, Set by UE | | |
| REQUEST_MODE | '001'B | | |
| SPECIAL_SERVICE | '1'B | | |
| SERVICE_OPTION | 16 bits, any value mapping to a voice service option | | |
| PM | '0'B | | |
| DIGIT_MODE | '0'B | | |
| NUMBER_TYPE | 3 bits, Set by UE | | |
| NUMBER_PLAN | 4 bits, Set by UE | | |
| MORE_FIELDS | '0'B | | |
| NUM_FIELDS | 8 bits, Set by UE | | |
| CHARI | Variable, Set by UE | | |
| NAR_AN_CAP | '0'B | | |
| PACA_REORIG | '0'B | | |
| RETURN_CAUSE | '0000'B | | |
| MORE_RECORDS | '0'B | | |
| ENCRYPTION_SUPPORTED | '0000'B | | |
| PACA_SUPPORTED | '0'B | | |
| NUM_ALT_SO | '000'B | | |
| DRS | '1'B | | |
| UZID_INCL | '0'B | | |
| CH_IND | '01'B | | |
| SR_ID | 3 bits, Set by UE | | |
| OTD_SUPPORTED | '1'B | | |
| QPCH_SUPPORTED | '1'B | | |
| ENHANCED_RC | '1'B | | |
| FOR_RC_PREF | '00011'B | | |
| REV_RC_PREF | '00011'B | | |
| FCH_SUPPORTED | '1'B | | |
| FCH Capability Type-specific fields | Variable | | |
| DCCH_SUPPORTED | '1'B | | |
| RESERVED | '0'B | | |

| | | | |
|--------------------|------|--|--|
| REV_FCH_GATING_REQ | '0'B | | |
|--------------------|------|--|--|

Table 8.4.7.10.3.3-10: DLInformationTransfer (Step 8, Table 8.4.7.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-3 | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| DLInformationTransfer ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| dlInformationTransfer-r8 SEQUENCE { | | | |
| dedicatedInfoType CHOICE { | False | | |
| dedicatedInfoCDMA2000-1XRTT | Set according to Table 8.4.7.10.3.3-11 | 1xRTT GCSNA Encapsulated Release Order message | |
| } | | | |
| } | | | |
| } | | | |

Table 8.4.7.10.3.3-11: 1xRTT GCSNA Encapsulated Release Order (Step 8, Table 8.4.7.10.3.2-2)

| Information Element | Value/remark | Comment | Condition |
|-----------------------------|-------------------|--|-----------|
| MessageID | '00000001'B | | |
| GCSNAOption | '00000001'B | | |
| AlternativeGCSNAOption_INCL | '0'B | | |
| IWSIDIncl | '0'B | | |
| AckRequired | '0'B | | |
| StopDupDetect | '0'B | | |
| MessageSequence | Set by SS | | |
| NumTLACEncapsulated1xL3PDU | '00'B | | |
| Reserved | '0000'B | | |
| 1xLogicalChannel | '1'B | | |
| 1xProtocolRevision | '00000110'B | | |
| MsgType | '00000111'B | Order message | |
| NumTLACHHeaderRecords | '0000'B | | |
| Reserved | '000'B | | |
| 1xL3PDULength | 8 bits, Set by SS | | |
| ORDER | '010101'B | | |
| ORDQ | '00000010'B | Release Order (with service inactive indication) | |

8.5 RRC others

8.5.1 Radio link failure

8.5.1.1 Radio link failure / RRC connection re-establishment success

8.5.1.1.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE detecting physical layer problems }
  then { UE shall start timer T310 and UE does not initiate any RRC Connection re-establishment
procedure before expiring of timer T310 }
}

```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE detecting radio link failure on expiring of timer T310 }
  then { UE starts timer T311 and UE initiates the RRC Connection re-establishment procedure }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE successfully completes the RRC Connection re-establishment procedure }
  then { UE is in E-UTRA RRC_CONNECTED state }
}
```

8.5.1.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in TS 36.331, clauses 5.3.7.2, 5.3.10.1, 5.3.10.3 and 5.3.10.4.

[TS 36.331 clause 5.3.7.2]

The UE shall only initiate the procedure when AS security has been activated. The UE initiates the procedure when one of the following conditions is met:

- 1> upon detecting radio link failure, in accordance with 5.3.11; or
- 1> upon handover failure, in accordance with 5.3.5.6; or
- 1> upon mobility from E-UTRA failure, in accordance with 5.4.3.5; or
- 1> upon integrity check failure indication from lower layers; or
- 1> upon an RRC connection reconfiguration failure, in accordance with 5.3.5.5;

Upon initiation of the procedure, the UE shall:

- 1> stop timer T310, if running;
- 1> start timer T311;
- 1> suspend all RBs except SRB0;
- 1> reset MAC;
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> perform cell selection in accordance with the cell selection process as specified in TS 36.304 [4];

[TS 36.331 clause 5.3.11.1]

The UE shall:

- 1> upon receiving N310 consecutive "out-of-sync" indications from lower layers while neither T300, T301, T304 nor T311 is running:
 - 2> start timer T310;

[TS 36.331 clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or

- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause ‘other’;
 - 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

8.5.1.1.3 Test description

8.5.1.1.3.1 Pre-test conditions

System Simulator:

- 2 cells on same E-UTRA frequency:
 - Cell 1 (default parameters) serving cell
 - Cell 2 intra-frequency cell

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) according to [18] on cell 1.

8.5.1.1.3.2 Test procedure sequence

Table 8.5.1.1.3.2-0: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 |
|---|-----------------------|------------|--------|--------|
| T1 | Cell-specific RS EPRE | dBm/15k Hz | “Off” | -85 |
| Power level “Off” is defined in TS36.508 Table 6.2.2.1-1. | | | | |

Table 8.5.1.1.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 and Cell 2 parameters according to the row "T1" in table 8.5.1.1.3.2-0 in order that the radio link quality of Cell 1 is degraded and cell 2 is suitable for camping. | - | - | - | - |
| 2 | Check: Does the UE initiate an RRC connection re-establishment procedure on Cell 1 or Cell 2. This is checked during the time T=T310. | - | - | 1 | F |
| 3 | Check: Does the UE send <i>RRCConnectionReestablishmentRequest</i> message on Cell 2? | --> | <i>RRCConnectionReestablishmentRequest</i> | 2 | P |
| 4 | The SS transmits <i>RRCConnectionReestablishment</i> message. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 5 | The UE transmits <i>RRCConnectionReestablishmentComplete</i> message. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 6 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume existing radio bearer. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 7 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 8 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 3 | P |

8.5.1.1.3.3 Specific message contents

Table 8.5.1.1.3.3-1: *RRCConnectionReestablishmentRequest* (step 3, Table 8.5.1.1.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCConnectionReestablishmentRequest</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.5.1.1.3.3-2: *RRCConnectionReconfiguration* (step 6, Table 8.5.1.1.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.5.1.2 Radio link failure / T301 expiry

8.5.1.2.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE having sent an RRCConnectionReestablishmentRequest message on starting of timer T301 }
  then { UE goes to RRC_IDLE state after timer T301 is expired and trigger TAU procedure in order
to recover RRC connection}
}

```

8.5.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in TS 36.331, clauses 5.3.7.2, 5.3.7.3, 5.3.7.7, 5.3.11.1 and 5.3.11.3. The following represent an extraction of the requirements relevant to the test purpose.

[TS 36.331 clause 5.3.7.2]

The UE shall only initiate the procedure when AS security has been activated. The UE initiates the procedure when one of the following conditions is met:

- 1> upon detecting radio link failure, in accordance with 5.3.11; or
- 1> upon handover failure, in accordance with 5.3.5.6; or
- 1> upon mobility from E-UTRA failure, in accordance with 5.4.3.5; or
- 1> upon integrity check failure indication from lower layers; or
- 1> upon an RRC connection reconfiguration failure, in accordance with 5.3.5.5;

Upon initiation of the procedure, the UE shall:

- 1> stop timer T310, if running;
- 1> start timer T311;
- 1> suspend all RBs except SRB0;
- 1> reset MAC;
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> perform cell selection in accordance with the cell selection process as specified in TS 36.304 [4];

[TS 36.331 clause 5.3.7.3]

Upon selecting a suitable E-UTRA cell, the UE shall:

- 1> stop timer T311;
- 1> start timer T301;
- 1> apply the *timeAlignmentTimerCommon* included in *SystemInformationBlockType2*;
- 1> initiate transmission of the *RRCConnectionReestablishmentRequest* message in accordance with 5.3.7.4;

NOTE: This procedure applies also if the UE returns to the source cell.

Upon selecting an inter-RAT cell, the UE shall:

- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

[TS 36.331 clause 5.3.7.7]

The UE shall:

- 1> if timer T301 expires; or
- 1> if the selected cell becomes no longer suitable according to the cell selection criteria as specified in TS 36.304 [4];
- 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

[TS 36.331 clause 5.3.11.1]

The UE shall:

- 1> upon receiving N310 consecutive "out-of-sync" indications from lower layers while neither T300, T301, T304 nor T311 is running;
- 2> start timer T310;

[TS 36.331 clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
 - 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

8.5.1.2.3 Test description

8.5.1.2.3.1 Pre-test conditions

System Simulator:

- 2 cells on same E-UTRA frequency:
 - Cell 1 (default parameters) serving cell
 - Cell 2 intra-frequency cell

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.5.1.2.3.2 Test procedure sequence

Table 8.5.1.2.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-----|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes the power level of Cell 1 to non-suitable "Off" and changes the power level of Cell 2 to suitable according to TS 36.508 subclause 6.2.2.1 in order that the radio link quality of Cell 1 is degraded. | - | - | - | - |
| 2 | The UE sends <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 3 | The SS does not respond to any <i>RRCConnectionReestablishmentRequest</i> message for 2s (T301). | - | - | - | - |
| 4-8 | The UE will perform TAU procedure based on steps 1 to 5 of subclause 6.4.2.7 in TS 36.508 on Cell 2. NOTE: The UE performs a TAU procedure due to NAS signalling connection recovery. | - | - | - | - |
| 9 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |
| - | At the end of this test procedure sequence, the UE is in end state E-UTRA connected (E2_T3440) according to TS 36.508. | - | - | - | - |

8.5.1.2.3.3 Specific message contents

Table 8.5.1.2.3.3-1: SystemInformationBlockType2 for Cell 2 (all steps)

| Derivation path: 36.508 table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| ue-TimersAndConstants SEQUENCE { | | | |
| t301 | ms2000 | | |
| } | | | |
| } | | | |

Table 8.5.1.2.3.3-2: *RRCConnectionReestablishmentRequest* (step 2, Table 8.5.1.2.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |

8.5.1.3 Radio link failure / T311 expiry

8.5.1.3.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state with default bearer established and radio link failure was
detected and UE attempts to select a suitable E-UTRA cell to re-establish the RRC connection }
ensure that {
  when { UE can not find a suitable cell within T311 }
    then { UE does not try to re-establish the RRC connection and goes to RRC_IDLE state after T311
expired }
}

```

8.5.1.3.2 Conformance requirements

The conformance requirements covered in the current test case are specified in TS 36.331 clause 5.3.7.2, 5.3.7.6 and 5.3.12.

[TS 36.331 clause 5.3.7.2]

...

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

1> start timer T311;

...

[TS 36.331 clause 5.3.7.6]

Upon T311 expiry, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure'.

[TS 36.331 clause 5.3.12]

Upon leaving RRC_CONNECTED, the UE shall:

1> reset MAC;

- 1> stop all timers that are running except T320;
- 1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established RBs;
- 1> indicate the release of the RRC connection to upper layers with the release cause;
- 1> if leaving RRC_CONNECTED was not triggered by reception of the *MobilityFromEUTRACommand* message:
 - 2> enter RRC_IDLE by performing cell selection in accordance with the cell selection process, defined for the case of leaving RRC_CONNECTED, as specified in TS 36.304 [4].

8.5.1.3.3 Test description

8.5.1.3.3.1 Pre-test conditions

System simulator:

2 cells on same E-UTRA frequency:

- Cell 1 (default parameters) serving cell
- Cell 11 intra-frequency cell

UE:

None.

Preamble:

- The UE is in Generic RB Established (state 3) according to [18] on Cell 1.

8.5.1.3.3.2 Test procedure sequence

Table 8.5.1.3.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|---------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes the power level of Cell 1 to non-suitable "Off" according to TS 36.508 subclause 6.2.2.1 in order that the radio link quality of Cell 1 is degraded. | - | - | - | - |
| 2 | Wait for 12s (T311 (10s) is transmitted in SIB2). | - | - | - | - |
| 3 | The SS changes the power level of Cell 11 to "Serving Cell" according to TS 36.508 subclause 6.2.2.1. | - | - | - | - |
| 4 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.7 indicate that the UE is camped on E-UTRAN Cell 11? NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | 1 | - |

8.5.1.3.3.3 Specific message contents

None.

8.5.1.4 Radio link failure / RRC connection re-establishment reject

8.5.1.4.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state with default bearer established and radio link failure was
detected and UE initiates the re-establishment procedure}
ensure that {
  when { the UE receives a RRCConnectionReestablishmentReject message }
```

```
    then { UE goes to RRC_IDLE and trigger TAU procedure in order to recover RRC connection }  
    }
```

8.5.1.4.2 Conformance requirements

The conformance requirements covered in the current test case are specified in TS 36.331 clause 5.3.7.8 and 5.3.12.

[TS 36.331 clause 5.3.7.8]

Upon receiving the *RRCConnectionReestablishmentReject* message, the UE shall:

- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure'.

[TS 36.331 clause 5.3.12]

Upon leaving RRC_CONNECTED, the UE shall:

- 1> reset MAC;
- 1> stop all timers that are running except T320;
- 1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established RBs;
- 1> indicate the release of the RRC connection to upper layers together with the release cause;
- 1> if leaving RRC_CONNECTED was not triggered by reception of the *MobilityFromEUTRACCommand* message:
 - 2> enter RRC_IDLE by performing cell selection in accordance with the cell selection process, defined for the case of leaving RRC_CONNECTED, as specified in TS 36.304 [4];

8.5.1.4.3 Test description

8.5.1.4.3.1 Pre-test conditions

System simulator:

- 2 cells on same E-UTRA frequency:
 - Cell 1(default parameters) serving cell
 - Cell 2 intra-frequency cell

UE:

None.

Preamble:

- The UE is in Generic RB Established (state 3) according to [18] on Cell 1.

8.5.1.4.3.2 Test procedure sequence

Table 8.5.1.4.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-----|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes the power level of Cell 1 to non-suitable "Off" cell according to TS 36.508 subclause 6.2.2.1 in order that the radio link quality of Cell 1 is degraded and set the power level of Cell 2 to suitable cell. | - | - | - | - |
| 2 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 3 | The SS transmits a <i>RRCConnectionReestablishmentReject</i> message | <-- | <i>RRCConnectionReestablishmentReject</i> | - | - |
| 4-8 | The UE will perform TAU procedure based on steps 1 to 5 of subclause 6.4.2.7 in TS 36.508 on Cell 2. NOTE: The UE performs a TAU procedure due to NAS signalling connection recovery. | - | - | - | - |
| 9 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |
| - | At the end of this test procedure sequence, the UE is in end state E-UTRA connected (E2_T3440) according to TS 36.508. | - | - | - | - |

8.5.1.4.3.3 Specific message contents

None.

8.5.1.5 Radio link failure / Radio link recovery while T310 is running

8.5.1.5.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE detecting physical layer recovery while T310 was running }
  then { the UE resumes the RRC connection without explicit signalling }
}
```

8.5.1.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331 clause 5.3.11.1 and 5.3.11.2.

[TS 36.331, clause 5.3.11.1]

The UE shall:

- 1> upon receiving N310 consecutive "out of sync" indications from lower layers while neither T300, T301, T304 nor T311 is running:
- 2> start timer T310.

[TS 36.331, clause 5.3.11.2]

Upon receiving N311 consecutive "in-sync" indications from lower layers while T310 is running, the UE shall:1> stop timer T310.

NOTE 1: In this case, the UE resumes the RRC connection without explicit signalling, i.e. the UE resumes the entire radio resource configuration.

NOTE 2: Periods in time where neither "in-sync" nor "out-of-sync" is reported by layer 1 do not affect the evaluation of the number of consecutive "in-sync" or "out-of-sync" indications

8.5.1.5.3 Test description

8.5.1.5.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None.

Preamble:

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

8.5.1.5.3.2 Test procedure sequence

Table 8.5.1.5.3.2-1 illustrates the downlink power level to be applied for the cell at various time instants of the test execution. Row marked "T0" denotes the initial condition, while column marked "T1" is applied according the procedure.

Table 8.5.1.5.3.2-1: Time instances of cell power level

| | Parameter | Unit | Cell 1 | Remark |
|----|-----------|--------------------|----------------------|---|
| T0 | RS EPRE | dBm/ 15kHz z | P _{default} | Power level from 36.508 clause 6.2.2.1. P _{default} as serving cell. |
| T1 | RS EPRE | dBm/ 15kHz z | P _{off} | P _{off} as non-suitable "Off" cell. |

Table 8.5.1.5.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|---------|----|---------|
| | | U - S | Message | | |
| | SS wait for the 660ms to ensure that DL Timing Advance is sent at least once and UE apply the value of timeAlignmentTimerDedicated which is updated during the preamble. | - | - | - | - |
| 1 | The SS changes Cell 1 level according to the row "T1" in table 8.5.1.5.3.2-1. | - | - | - | - |
| 2 | SS waits for 1.5s. The T310 is 2s. | - | - | - | - |
| 3 | The SS changes Cell 1 level according to the row "T0" in table 8.5.1.5.3.2-1. | - | - | - | - |
| 4 | SS waits for 5s. Check: Does the UE transmit any signalling message? | - | - | 1 | F |
| 5 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 1 | - |

8.5.1.5.3.3 Specific message contents

Table 8.5.1.5.3.3-1: SystemInformationBlockType2 (preamble and all steps, Table 8.5.1.5.3.2-2)

| Derivation path: 36.508 table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| ue-TimersAndConstants SEQUENCE { | | | |
| t310 | ms2000 | | |
| } | | | |
| } | | | |

Table 8.5.1.5.3.3-2: RRCConnectionReconfiguration (preamble: Table 4.5.3.3-1 [18], step 8)

| Derivation path: 36.508 table 4.8.2.1.5-1 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| RadioResourceConfigDedicated SEQUENCE { | | | |
| mac-MainConfig CHOICE { | | | |
| timeAlignmentTimerDedicated | Infinity | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

NOTE: As per test model SS is not configured to transmit PDCCH orders and it expects UE to be PUCCH synchronized throughout the test sequence.

8.5.1.6 Radio link failure / T311 expiry / Dedicated RLF timer

8.5.1.6.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives an RRCConnectionReconfiguration message containing an rlf-TimersAndConstants-r9
set to setup }
  then { UE uses timer value received in the RRCConnectionReconfiguration message }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state and having received an RRCConnectionReconfiguration message
containing an rlf-TimersAndConstants-r9 set to setup }
ensure that {
  when { UE receives SystemInformationBlockType2 containing different timer value from
RRCConnectionReconfiguration message }
  then { UE continues to use timer value received in the RRCConnectionReconfiguration message }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state and having received an RRCConnectionReconfiguration message
containing an rlf-TimersAndConstants-r9 set to setup }
ensure that {
  when { UE receives an RRCConnectionReconfiguration message containing an rlf-TimersAndConstants-r9
set to release }
  then { UE does not use timer value received in the RRCConnectionReconfiguration message }
}
```

8.5.1.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331 clause 5.2.2.9, 5.3.7.2, 5.3.7.6, 5.3.10.0, 5.3.10.7 and 5.3.12.

[TS 36.331 clause 5.2.2.9]

Upon receiving *SystemInformationBlockType2*, the UE shall:

...

- 1> if in RRC_CONNECTED and UE has previously received *rlf-TimersAndConstants*:
 - 2> The UE shall not update its values of the timers and constants in *UE-TimersAndConstants* except for the value of timer T300.

[TS 36.331 clause 5.3.7.2]

Upon initiation of the procedure, the UE shall:

- 1> stop timer T310, if running;
- 1> start timer T311;

[TS 36.331 clause 5.3.7.6]

Upon T311 expiry, the UE shall:

- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

[TS 36.331 clause 5.3.10.0]

The UE shall:

...

- 1> if the received *radioResourceConfigDedicated* includes the *rlf-TimersAndConstants*:
 - 2> reconfigure the values of timers and constants as specified in 5.3.10.7;

[TS 36.331 clause 5.3.10.7]

The UE shall:

- 1> if the received *rlf-TimersAndConstants* is set to 'release':
 - 2> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SystemInformationBlockType2*;
- 1> else:
 - 2> reconfigure the value of timers and constants in accordance with received *rlf-TimersAndConstants*;

[TS 36.331 clause 5.3.12]

Upon leaving RRC_CONNECTED, the UE shall:

- 1> reset MAC;
- 1> stop all timers that are running except T320;
- 1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established RBs;
- 1> indicate the release of the RRC connection to upper layers together with the release cause;
- 1> if leaving RRC_CONNECTED was not triggered by reception of the *MobilityFromEUTRACommand* message:

2> enter RRC_IDLE and perform procedures as specified in TS 36.304 [4, 5.2.7];

8.5.1.6.3 Test description

8.5.1.6.3.1 Pre-test conditions

System simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.5.1.6.3.2 Test procedure sequence

Table 8.5.1.6.3.2-1 illustrates the downlink power levels to be applied for the cells at various time instants of the test execution. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.5.1.6.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Remark |
|--|-----------------------|------------|--------|--------|-------------------------------------|
| T1 | Cell-specific RS EPRE | dBm/15 kHz | "Off" | "Off" | No Cells are available. (NOTE 1). |
| T2 | Cell-specific RS EPRE | dBm/15 kHz | "Off" | -85 | Only Cell 2 is available. (NOTE 1). |
| T3 | Cell-specific RS EPRE | dBm/15 kHz | -85 | "Off" | Only Cell 1 is available. (NOTE 1). |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.5.1.6.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 levels according to row "T1" in Table 8.5.1.6.3.2-1. | - | - | - | - |
| 2 | Wait for 5s. | - | - | - | - |
| 3 | The SS changes Cell 2 levels according to row "T2" in Table 8.5.1.6.3.2-1. | - | - | - | - |
| 4 | Check: Does the UE transmit an <i>RRCConnectionRequest</i> message on Cell 2? | --> | <i>RRCConnectionRequest</i> | 1 | P |
| 5-9 | Steps 2 to 6 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 2. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 10 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 11-18 | Steps 2 to 9 of the generic test procedure in TS 36.508 subclause 4.5.3.3 are performed on Cell 2. NOTE: The UE performs the establishment of the data radio bearer associated with the default EPS bearer context. | - | - | - | - |
| 19 | The SS transmits a <i>Paging</i> message including <i>systemInfoModification</i> on Cell 2. | <-- | <i>Paging</i> | - | - |
| 20 | Wait for 2.1* modification period for the UE to receive system information. | - | - | - | - |
| 21 | The SS changes Cell 2 levels according to row "T1" in Table 8.5.1.6.3.2-1. | - | - | - | - |
| 22 | Wait for 5s. | - | - | - | - |
| 23 | The SS changes Cell 1 levels according to row "T3" in Table 8.5.1.6.3.2-1. | - | - | - | - |
| 24 | Check: Does the UE transmit an <i>RRCConnectionRequest</i> message on Cell 1? | --> | <i>RRCConnectionRequest</i> | 2 | P |
| 25-29 | Steps 2 to 6 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 1. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 30 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 31-38 | Steps 2 to 9 of the generic test procedure in TS 36.508 subclause 4.5.3.3 are performed on Cell 1. NOTE: The UE performs the establishment of the data radio bearer associated with the default EPS bearer context. | - | - | - | - |
| 39 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 40 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 41 | The SS changes Cell 1 levels according to row "T1" in Table 8.5.1.6.3.2-1. | - | - | - | - |
| 42 | Wait for 5s. | - | - | - | - |
| 43 | The SS changes Cell 2 levels according to row "T2" in Table 8.5.1.6.3.2-1. | - | - | - | - |
| 44 | Check: Does the UE transmit an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2? | --> | <i>RRCConnectionReestablishmentRequest</i> | 3 | P |
| 45 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 46 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |

| | | | | | |
|----|---|-----|---|---|---|
| | message on Cell 2. | | | | |
| 47 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 48 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 49 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 3 | - |

8.5.1.6.3.3 Specific message contents

Table 8.5.1.6.3.3-1: SystemInformationBlockType2 for Cell 1 (preamble and all steps, Table 8.5.1.6.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| ue-TimersAndConstants SEQUENCE { | | | |
| t311 | ms30000 | | |
| } | | | |
| } | | | |

Table 8.5.1.6.3.3-2: RRCConnectionReconfiguration (preamble, step 17 and 37 Table 8.5.1.6.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition SRB2-DRB(1, 0) |
|--|

Table 8.5.1.6.3.3-3: RadioResourceConfigDedicated (Table 8.5.1.6.3.3-2)

| Derivation Path: 36.508, Table 4.6.3-16 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RadioResourceConfigDedicated ::= SEQUENCE { | | | |
| rlf-TimersAndConstants-r9 CHOICE { | | | |
| setup SEQUENCE { | | | |
| t301-r9 | ms1000 | | |
| t310-r9 | ms1000 | | |
| n310-r9 | n1 | | |
| t311-r9 | ms1000 | | |
| n311-r9 | n1 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.5.1.6.3.3-4: Paging (step 19, Table 8.5.1.6.3.2-2)

| Derivation Path: 36.508 Table 4.6.1-7 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| Paging ::= SEQUENCE { | | | |
| pagingRecordList | Not present | | |
| systemInfoModification | true | | |
| } | | | |

Table 8.5.1.6.3.3-5: SystemInformationBlockType2 for Cell 2 (step 20, Table 8.5.1.6.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| ue-TimersAndConstants SEQUENCE { | | | |
| t311 | ms30000 | | |
| } | | | |
| } | | | |

Table 8.5.1.6.3.3-6: RRCConnectionReconfiguration (step 39, Table 8.5.1.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated SEQUENCE { | RadioResourceConfigDe dedicated-NON-DEFAULT | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.5.1.6.3.3-7: RadioResourceConfigDedicated-NON-DEFAULT (Table 8.5.1.6.3.3-6)

| Derivation Path: 36.508, Table 4.6.3-18A | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RadioResourceConfigDedicated-NON-DEFAULT ::= SEQUENCE { | | | |
| srb-ToAddModList | Not present | | |
| drb-ToAddModList | Not present | | |
| drb-ToReleaseList | Not present | | |
| mac-MainConfig | Not present | | |
| sps-Config | Not present | | |
| physicalConfigDedicated | Not present | | |
| rlf-TimersAndConstants-r9 CHOICE { | | | |
| release | NULL | | |
| } | | | |
| } | | | |

8.5.1.7 CA / No Radio Link Failure on SCell / RRC Connection Continues on PCell**8.5.1.7.1 CA / No Radio Link Failure on SCell / RRC Connection Continues on PCell / Intra-band Contiguous CA****8.5.1.7.1.1 Test Purpose (TP)**

(1)

```
with { UE in E-UTRA RRC_CONNECTED, security activated and SCell configured }
ensure that {
  when { UE drops out out service on SCell }
  then { UE does not consider radio link failure to be detected and stay in RRC_CONNECTED state }
}
```

8.5.1.7.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.3.10.7, 5.3.11.1 and 5.3.11.3.

[TS 36.331, clause 5.3.10.7]

The UE shall:

- 1> if the received *rlf-TimersAndConstants* is set to release:
 - 2> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SystemInformationBlockType2*;
- 1> else:
 - 2> reconfigure the value of timers and constants in accordance with received *rlf-TimersAndConstants*;

[TS 36.331, clause 5.3.11.1]

The UE shall:

- 1> upon receiving N310 consecutive "out-of-sync" indications for the PCell from lower layers while neither T300, T301, T304 nor T311 is running:
 - 2> start timer T310;

NOTE: Physical layer monitoring and related autonomous actions do not apply to SCells.

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;

- 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCONNECTIONRECONFIGURATION* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48, hours after the radio link failure is detected, upon power off or upon detach.

8.5.1.7.1.3 Test description

8.5.1.7.1.3.1 Pre-test conditions

System Simulator:

- Cell 1, and Cell 3
- Cell 1 is PCell
- Cell 3 is SCell
- Cell 3 is an Inactive SCell according to [18] cl. 6.3.4
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.5.1.7.1.3.2 Test procedure sequence

Table 8.5.1.7.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.5.1.7.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Remark |
|----|-----------------------|------------|--------|--------|--------------------------------|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -85 | Cell1 and Cell 3 are available |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -85 | "Off" | Only Cell 1 is available. |

Table 8.5.1.7.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 1 to configure SCell. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 2A | Wait for 1s. | - | - | - | - |
| 3 | The SS changes power levels according to row "T1" in Table 8.5.1.7.1.3.2-1. | - | - | - | - |
| 4 | Wait for 1s. | - | - | - | - |
| 5 | Check: Does the UE transmit an <i>RRConnectionReestablishmentRequest</i> message on Cell 1? | --> | <i>RRConnectionReestablishmentRequest</i> | 1 | F |
| 6 | Check: Does the test result of CALL generic test procedure in 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 1 | - |

8.5.1.7.1.3.3 Specific message contents

Table 8.5.1.7.1.3.3-1: *RRConnectionReconfiguration* (step 1, Table 8.5.1.7.1.3.2-2)

| |
|---|
| Derivation Path: 36.508 Table 4.6.1-8, condition SCell_AddMod |
|---|

Table 8.5.1.7.1.3.3-2: *SCellToAddMod-r10* (Table 8.5.1.7.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.3-19D | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>SCellToAddMod-r10</i> ::= SEQUENCE { | | | |
| <i>sCellIndex-r10</i> | 1 | | |
| <i>cellIdentification-r10</i> SEQUENCE { | | | |
| <i>physCellId-r10</i> | PhysicalCellIdentity of Cell 3 | | |
| <i>dl-CarrierFreq-r10</i> | Same downlink EARFCN as used for Cell 3 | | |
| } | | | |
| } | | | |

Table 8.5.1.7.1.3.3-3: *RadioResourceConfigCommonSCell-r10* (Table 8.5.1.7.1.3.3-2)

| Derivation Path: 36.508, Table 4.6.3-13A | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RadioResourceConfigCommonSCell-r10</i> ::= SEQUENCE { | | | |
| <i>nonUL-Configuration-r10</i> SEQUENCE { | | | |
| <i>dl-Bandwidth-r10</i> | Same downlink system bandwidth as used for Cell 3 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

8.5.1.7.2 CA / No Radio Link Failure on SCell / RRC Connection Continues on PCell / Inter-band CA

The scope and description of the present TC is the same as test case 8.5.1.7.1 with the following differences:

- CA configuration: Inter-band CA replaces Intra-band Contiguous CA
- Cells configuration: Cell 10 replaces Cell 3
- Cell 10 is an Inactive SCell according to [18] cl. 6.3.4

8.5.2 Redirection to E-UTRAN

8.5.2.1 Redirection to E-UTRAN / From UTRAN upon reception of RRC CONNECTION REJECT

8.5.2.1.1 Test Purpose (TP)

(1)

```
with { UE in UTRA Idle state }
ensure that {
  when { UE is requested to make an outgoing PS call }
  then { UE includes in the RRC CONNECTION REQUEST the IE Pre-Redirection info }
}
```

(2)

```
with { UE in UTRA CELL_DCH state }
ensure that {
  when { UE receives an RRC CONNECTION REJECT message including an IE Redirection info with E-UTRA target info E-UTRA frequency }
  then { UE enters RRC_IDLE state on E-UTRAN Carrier included in IE Redirection info }
}
```

8.5.2.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 25.331, clause 8.1.3.3, 8.1.4.3 and clause 8.5.2.

[TS 25.331, clause 8.1.3.3]

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

...

- 1> if the UE supports E-UTRA:
 - 2> if the variable EUTRA_FREQUENCY_INFO_LIST contains no E-UTRA frequencies:
 - 3> include the IE "Pre-Redirection info";
 - 3> if the UE supports E-UTRA FDD:
 - 4> set the IE "Support of E-UTRA FDD" to TRUE.
 - 3> if the UE supports E-UTRA TDD:
 - 4> set the IE "Support of E-UTRA TDD" to TRUE.
 - 2> if the UE supports any of the bands that the E-UTRA frequencies included in the variable EUTRA_FREQUENCY_INFO_LIST belong to:
 - 3> include the IE "Pre-Redirection info";
 - 3> if the UE supports any of the bands that the E-UTRA FDD frequencies included in the variable EUTRA_FREQUENCY_INFO_LIST belong to:
 - 4> set the IE "Support of E-UTRA FDD" to TRUE.

- 3> if the UE supports any of the bands that the E-UTRA TDD frequencies included in the variable EUTRA_FREQUENCY_INFO_LIST belong to:
 - 4> set the IE "Support of E-UTRA TDD" to TRUE.

[TS 25.331, clause 8.1.3.9]

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:

...

- 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 (e.g. the "E-UTRA Target Cell Blacklist" 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.

8.5.2.1.3 Test description

8.5.2.1.3.1 Pre-test conditions

System Simulator:

- 2 cells, one UTRA and one E-UTRA cell:
 - Cell 5 UTRA serving cell (priority 4 default)
 - Cell 1 suitable neighbour E-UTRA cell (priority 3)

UE:

UTRAN Idle state

Preamble:

State 3 or state 7 as specified in clause 7.4 of TS 34.108, depending on the CN domain(s) supported by the UE.

8.5.2.1.3.2 Test procedure sequence

Table 8.5.2.1.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|------------------------|----|---------|
| | | U - S | Message | | |
| 1 | Make the UE initiate an outgoing PS call. | - | - | - | - |
| 2 | Check: does the UE include the IE Pre-redirection info with Support of E-UTRA set to TRUE? | --> | RRC CONNECTION REQUEST | 1 | P |
| 3 | The SS transmit a RRC CONNECTION REJECT | <-- | RRC CONNECTION REJECT | - | - |
| 4 | Check: Does the test result of generic test procedure in TS 36.508 Table 6.4.2.7A-2 indicate that the UE is camped on E-UTRAN Cell 1? | - | - | 2 | - |

8.5.2.1.3.3 Specific message or IE contents

Table 8.5.2.1.3.3-1 System Information Block type 19 for cell 5 (preamble and all steps, Table 8.5.2.1.3.2-1)

| Derivation Path: 36.508 Table 4.4.4.1-1 | | | |
|---|---------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SysInfoType19 ::= SEQUENCE { | | | |
| utra-PriorityInfoList SEQUENCE { | | | |
| utra-ServingCell SEQUENCE { | | | |
| priority | 4 | | |
| } | | | |
| utra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE | 1 entry | | |
| earfcn[1] | Downlink EARFCN of Cell 1 | | |
| priority[1] | 3 | | |
| } | | | |
| } | | | |

Table 8.5.2.1.3.3-2: RRC CONNECTION REQUEST (UTRA Rel-8)

| Derivation path: 34.108 default RRC CONNECTION REQUEST in section 9.1.1 for UTRA FDD or 9.1.2 for UTRA TDD | | | |
|--|--------------|--|------------|
| Information Element | Value/Remark | Comment | Condition |
| Pre-redirection info | | The presence of this IE indicates the UE support of radio access technologies that the UE could be directed to | |
| Support of E-UTRA FDD | TRUE | | E-UTRA-FDD |
| Support of E-UTRA TDD | TRUE | | E-UTRA-TDD |
| Domain indicator | PS domain | | |

Table 8.5.2.1.3.3-2: RRC CONNECTION REJECT (UTRA Rel-8)

| Derivation path: 34.108 default RRC CONNECTION REJECT in section 9.1.1 for UTRA FDD or 9.1.2 for UTRA TDD | | | |
|---|---|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Wait Time | 15 | | |
| Redirection info | | | |
| Inter-RAT info | E-UTRA | | |
| E-UTRA target info | | | |
| E-UTRA Target Frequency Info List | 1 Entry | | |
| DL Carrier frequency | EARFCN of the downlink Cell 1 carrier frequency | | |

8.5.3 Void

8.5.4 UE capability transfer

8.5.4.1 UE capability transfer / Success

8.5.4.1.1 Test Purpose (TP)

(1)

```
with { UE in RRC_CONNECTED state }
ensure that {
  when { UE receives an UECapabilityEnquiry message before AS security is activated }
  then { UE transmits an UECapabilityInformation message including UE radio access capability
information corresponding to the ue-CapabilityRequest variable }
}
```

(2)

```
with { UE in RRC_CONNECTED state }
ensure that {
  when { UE receives an UECapabilityEnquiry message after AS security is activated }
  then { UE transmits an UECapabilityInformation message including UE radio access capability
information corresponding to the ue-CapabilityRequest variable }
}
```

8.5.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.6.3.3 and TS 25.331, clause 8.1.16.3.

[TS 36.331, clause 5.6.3.3]

The UE shall:

- 1> set the contents of *UECapabilityInformation* message as follows:
 - 2> if the *ue-CapabilityRequest* includes 'eutra':
 - 3> include the *UE-EUTRA-Capability* within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to 'eutra';
 - 2> if the *ue-CapabilityRequest* includes 'geran-cs' and if the UE supports GERAN CS domain:
 - 3> include the UE radio access capabilities for GERAN CS within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to 'geran-cs';
 - 2> if the *ue-CapabilityRequest* includes 'geran-ps' and if the UE supports GERAN PS domain:
 - 3> include the UE radio access capabilities for GERAN PS within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to 'geran-ps';
 - 2> if the *ue-CapabilityRequest* includes 'utra' and if the UE supports UTRA:

- 3> include the UE radio access capabilities for UTRA within a *ueCapabilityRAT-Container* and with the *rat-Type* set to 'utra';
- 2> if the *ue-CapabilityRequest* includes 'cdma2000-1XRTT' and if the UE supports CDMA2000-1XRTT:
 - 3> include the UE radio access capabilities for CDMA 2000 within a *ueCapabilityRAT-Container* and with the *rat-Type* set to 'cdma2000-1XRTT';
- 1> submit the *UECapabilityInformation* message to lower layers for transmission, upon which the procedure ends.

[TS 25.331, clause 8.1.16.3]

The UE shall:

- 1> include the IE "UE security information", and the IE "UE security information2" if inter-RAT PS handover is supported by the UE; and
- 1> not include the IE "UE Specific Behaviour Information 1 interRAT";
- 1> in case support for the compressed version of the inter RAT handover info is indicated via the other radio access technology:
 - 2> if the other radio access technology is not E-UTRA:
 - 3> include of the following IEs the IE that after encoding has the smallest size: IE "Predefined configuration status information compressed" or the IE "Predefined configuration status information".
 - 2> else:
 - 3> exclude the IE "Predefined configuration status information" and "Predefined configuration status information compressed".
 - 2> include the IE "UE radio access capability compressed".
- 1> else:
 - 2> if the other radio access technology is not E-UTRA:
 - 3> include the IE "Predefined configuration status information".
 - 2> else:
 - 3> exclude the IE "Predefined configuration status information".
 - 2> include the IE "UE capability container", containing the IE "UE radio access capability" and the IE "UE radio access capability extension", in accordance with the following:
 - 3> if the UE supports multiple UTRA FDD Frequency Bands; or
 - 3> if the UE supports a single UTRA FDD Frequency Band different from Band I [21]; or
 - 3> if the UE supports E-UTRA:
 - 4> include the IE "UE radio access capability", excluding IEs "RF capability FDD" and "Measurement capability" for FDD and including the IE "Measurement capability TDD" for TDD;
 - 4> include the IE "UE radio access capability extension", including the IEs "RF capability FDD extension", the "Measurement capability extension", the "Additional Secondary Cells" and the "Non-contiguous multi-cell" associated with each supported UTRA FDD frequency band indicated in the IE "Frequency band", but may omit all or part of these IEs for supported inter-RAT bands.
 - 3> else:
 - 4> include the IE "UE radio access capability", including the IEs "RF capability FDD" and "Measurement capability" associated with the Band I [21] for FDD and excluding the IE "Measurement capability TDD" for TDD;

4> include the IE "UE radio access capability extension", including the IEs "RF capability FDD extension", the "Measurement capability extension", the "Additional Secondary Cells" and the "Non-contiguous multi-cell" associated with each supported UTRA FDD frequency band indicated in the IE "Frequency band".

1> For FDD, include the IE "UE radio access capability comp 2";

1> For 1.28 Mcps TDD, include the IE "UE radio access capability comp for 1.28 Mcps TDD";

1> initiate the transfer of the INTER RAT HANDOVER INFO message via the other radio access technology, using radio access technology-specific procedures;

1> store the following in the variable INTER_RAT_HANDOVER_INFO_TRANSFERRED if they were included in the INTER RAT HANDOVER INFO message:

2> the IE "Predefined configuration status information";

2> the IE "Predefined configuration status information compressed";

2> the IE "UE security information";

2> the IE "UE security information2";

2> the IE "UE radio access capability";

2> the IE "UE radio access capability extension"; and

2> the IE "UE radio access capability compressed";

2> if the IE "UE radio access capability compressed" were included in the INTER RAT HANDOVER INFO message:

3> set the IE "Security Capability" to the mandatory R99 algorithms.

1> and the procedure ends.

8.5.4.1.3 Test description

8.5.4.1.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None.

Preamble:

- The UE is in state Switched OFF (state 1) according to [18].

8.5.4.1.3.2 Test procedure sequence

Table 8.5.4.1.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The UE is switched on. | - | - | - | - |
| 2 | The UE transmits an <i>RRCCONNECTIONREQUEST</i> message. | --> | <i>RRCCONNECTIONREQUEST</i> | - | - |
| 3 | The SS transmits an <i>RRCCONNECTIONSETUP</i> message. | <-- | <i>RRCCONNECTIONSETUP</i> | - | - |
| 4 | The UE transmits an <i>RRCCONNECTIONSETUPCOMPLETE</i> . This message includes an ATTACH REQUEST and a PDN CONNECTIVITY REQUEST message. | --> | <i>RRCCONNECTIONSETUPCOMPLETE</i> | - | - |
| 5 | The SS transmits a <i>DLINFORMATIONTRANSFER</i> message. This message includes an AUTHENTICATION REQUEST message. | <-- | <i>DLINFORMATIONTRANSFER</i> | - | - |
| 6 | The UE transmits a <i>ULINFORMATIONTRANSFER</i> message. This message includes an AUTHENTICATION RESPONSE message. | --> | <i>ULINFORMATIONTRANSFER</i> | - | - |
| 7 | The SS transmits a <i>DLINFORMATIONTRANSFER</i> message. This message includes a SECURITY MODE COMMAND message. | <-- | <i>DLINFORMATIONTRANSFER</i> | - | - |
| 8 | The UE transmits a <i>ULINFORMATIONTRANSFER</i> message. This message includes a SECURITY MODE COMPLETE message. | --> | <i>ULINFORMATIONTRANSFER</i> | - | - |
| 9 | The SS transmits a <i>UECAPABILITYENQUIRY</i> message to request UE radio access capability information for E UTRA only. | <-- | <i>UECAPABILITYENQUIRY</i> | - | - |
| 10 | Check: Does the UE transmit a <i>UECAPABILITYINFORMATION</i> message? | --> | <i>UECAPABILITYINFORMATION</i> | 1 | P |
| 11 | The SS transmits a <i>SECURITYMODECOMMAND</i> message to activate AS security. | <-- | <i>SECURITYMODECOMMAND</i> | - | - |
| 12 | The UE transmits a <i>SECURITYMODECOMPLETE</i> message and establishes the initial security configuration. | --> | <i>SECURITYMODECOMPLETE</i> | - | - |
| - | EXCEPTION: Steps 13a1 to 13a2 describe behaviour that depends on UE configuration; the "lower case letter" identifies a step sequence that take place if the UE has ESM information which needs to be transferred after SECURITY MODE COMPLETE message. | - | - | - | - |
| 13a 1 | IF the UE sets the ESM information transfer flag in the last PDN CONNECTIVITY REQUEST message THEN the SS transmits a <i>DLINFORMATIONTRANSFER</i> message. This message includes an ESM INFORMATION REQUEST message. | <-- | <i>DLINFORMATIONTRANSFER</i> | - | - |
| 13a 2 | The UE transmits a <i>ULINFORMATIONTRANSFER</i> message. This message includes an ESM INFORMATION RESPONSE message. | --> | <i>ULINFORMATIONTRANSFER</i> | - | - |
| 14 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to establish a data radio bearer. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 15 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> . | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 16 | The UE transmits a <i>ULINFORMATIONTRANSFER</i> message. This message includes an ATTACH COMPLETE message. | --> | <i>ULINFORMATIONTRANSFER</i> | - | - |
| 17 | The SS transmits a <i>UECAPABILITYENQUIRY</i> | <-- | <i>UECAPABILITYENQUIRY</i> | - | - |

| | | | | | |
|----------|--|-----|--------------------------------|---|---|
| | message to request UE radio access capability information for E-UTRA only. | | | | |
| 18 | Check: Does the UE transmit a <i>UECapabilityInformation</i> message? | --> | <i>UECapabilityInformation</i> | 2 | P |
| - | EXCEPTION: Steps 19a1 to 19a2 describe behaviour that depends on the UE capability. | - | - | - | - |
| 19a 1 | IF <i>pc_FDD</i> , <i>pc_TDD_HCR</i> , <i>pc_TDD_LCR</i> , <i>pc_TDD_VHCR</i> , <i>pc_GERAN</i> , <i>pc_1xRTT</i> or <i>pc_HRPD</i> THEN the SS transmits a <i>UECapabilityEnquiry</i> message to request UE radio access capability information for every other supported RATs. | <-- | <i>UECapabilityEnquiry</i> | - | - |
| 19a 2 | Check: Does the UE transmit a <i>UECapabilityInformation</i> message? | --> | <i>UECapabilityInformation</i> | 2 | P |

8.5.4.1.3.3 Specific message contents

Table 8.5.4.1.3.3-1: UECapabilityEnquiry (step 9 and 17, Table 8.5.4.1.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-22 | | | |
|---|--------------|-------------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| <i>UECapabilityEnquiry</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| <i>c1</i> CHOICE { | | | |
| <i>ueCapabilityEnquiry-r8</i> SEQUENCE { | | | |
| <i>ue-CapabilityRequest</i> SEQUENCE (SIZE (1.. <i>maxRAT-Capabilities</i>)) OF SEQUENCE { | 1 entry | E-UTRA only | |
| <i>RAT-Type</i> [1] | <i>eutra</i> | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.5.4.1.3.3-2: UECapabilityInformation (step 10 and 18, Table 8.5.4.1.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-23 | | | |
|--|---|--|----------------|
| Information Element | Value/Remark | Comment | Condition |
| UECapabilityInformation ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueCapabilityInformation-r8 SEQUENCE { SIZE (1..maxRAT-Capabilities)) OF SEQUENCE { | 1 entry only | | |
| rat-Type[1] | eutra | E-UTRA only | |
| ueCapabilitiesRAT-Container[1] OCTET STRING { | | | |
| UE-EUTRA-Capability SEQUENCE { | | | |
| accessStratumRelease | Not checked | Value should be based on Rel of Access stratum supported | |
| ue-Category | Checked against UE Category indications in the PICS | | Rel-8 or Rel-9 |
| pdcp-Parameters | Not checked | | Rel-8 |
| pdcp-Parameters SEQUENCE { | | | > Rel-8 |
| supportedROHC-Profiles SEQUENCE { | | | |
| profile0x0001 | Not checked | | |
| profile0x0001 | true | | ROHC |
| profile0x0002 | Not checked | | |
| profile0x0002 | true | | ROHC |
| profile0x0003 | Not checked | | |
| profile0x0004 | Not checked | | |
| profile0x0006 | Not checked | | |
| profile0x0101 | Not checked | | |
| profile0x0102 | Not checked | | |
| profile0x0103 | Not checked | | |
| profile0x0104 | Not checked | | |
| } | | | |
| maxNumberROHC-ContextSessions | Not checked | | |
| } | | | |
| phyLayerParameters SEQUENCE { | | | |
| ul-AntennaSelectionSupported | Not checked | | |
| ue-SpecificRefSigsSupported | Not checked | | |
| } | | | |
| rf-Parameters SEQUENCE { | | | |
| supportedBandListEUTRA (SIZE (1..maxBands)) OF SEQUENCE { | n entries where n is the sum of pc_eBand α _Supp for $\alpha = 1$ to 64 | n is the number of supported EUTRA bands | |
| BandListEUTRA SEQUENCE { | | | |
| bandEUTRA [$\alpha = 1..n$] | Any value β such that pc_eBand β _Supp is TRUE and different from all eutra-Band[k] where k = 1 to $\alpha - 1$ | | |
| halfDuplex [$\alpha = 1..n$] | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| measurementParameters SEQUENCE { | | | |
| BandListEUTRA (SIZE (1..maxBands)) OF SEQUENCE { | same number of entries like in SupportedBandListEUTRA | | |
| BandInfoEUTRA SEQUENCE { | | | |
| InterFreqBandList (SIZE (1..maxBands)) OF SEQUENCE { | m entries (contents not checked, but m shall be equal to the number of bands listed in each IE present in <i>interRAT-</i> | | |

| | | | |
|--|--|--|-------------|
| | <i>Parameters)</i> | | |
| InterFreqBandInfo | | | |
| } | | | |
| InterRAT-BandList (SIZE (1..maxBands)) | | | |
| OF SEQUENCE { | | | |
| InterRAT-BandInfo | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| featureGroupIndicators | shall be set according to the corresponding PICS items | | |
| -- FGI 1 | Checked | | |
| -- FGI 2 | Checked | | |
| -- FGI 3 | Checked | | |
| -- FGI 4 | Checked | | |
| -- FGI 5 | Checked | | |
| -- FGI 6 | Checked | | |
| -- FGI 7 | Checked | | |
| -- FGI 8 | Checked | | |
| -- FGI 9 | Checked | | |
| -- FGI 10 | Checked | | |
| -- FGI 11 | Checked | | |
| -- FGI 12 | Checked | | |
| -- FGI 13 | Checked | | |
| -- FGI 14 | Checked | | |
| -- FGI 15 | Checked | | |
| -- FGI 16 | Checked | | |
| -- FGI 17 | Checked | | |
| -- FGI 18 | Checked | | |
| -- FGI 19 | Checked | | |
| -- FGI 20 | Checked | | |
| -- FGI 21 | Checked | | |
| -- FGI 22 | Checked | | |
| -- FGI 23 | Checked | | |
| -- FGI 24 | Checked | | |
| -- FGI 25 | Checked | | |
| -- FGI 26 | Checked | | |
| -- FGI 27 | Checked | | |
| -- FGI 28 | Checked | | |
| -- FGI 29 | Checked | | |
| -- FGI 30 | Checked | | |
| -- FGI 31 | Checked | | |
| -- FGI 32 | '0'B (Undefined) | | |
| interRAT-Parameters SEQUENCE { | m elements are present | | |
| utraFDD | Present but value not checked | | pc_FDD |
| utraTDD128 | Present but value not checked | | pc_TDD_LCR |
| utraTDD384 | Present but value not checked | | pc_TDD_HCR |
| utraTDD768 | Present but value not checked | | pc_TDD_VHCR |
| geran | Present but value not checked | | pc_GERAN |
| cdma2000-HRPD | Present but value not checked | | pc_HRPD |
| cdma2000-1xRTT | Present but value not checked | | pc_1xRTT |
| } | | | |
| nonCriticalExtension SEQUENCE { | | | |
| phyLayerParameters-v920 | Not checked | | |
| interRAT-ParametersGERAN-v920 | Not checked | | |
| interRAT-ParametersUTRA-v920 | Not checked | | |
| interRAT-ParametersCDMA2000-v920 | Not checked | | |

| | | | |
|---|--|--------------|-----------|
| deviceType-r9 | Not checked | | |
| csg-ProximityIndicationParameters-r9 | Not checked | | |
| neighCellSI-AcquisitionParameters-r9 | Not checked | | |
| son-Parameters-r9 | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension SEQUENCE { | | | |
| featureGroupIndRel9Add-r9 | If present, shall be set according to the corresponding PICS items | | |
| -- FGI 33 | Checked | | |
| -- FGI 34 | Checked | | |
| -- FGI 35 | Checked | | |
| -- FGI 36 | Checked | | |
| -- FGI 37 | Checked | | |
| -- FGI 38 | Checked | | |
| -- FGI 39 | Checked | | |
| -- FGI 40 | Checked | | |
| -- FGI 41 | Checked | | |
| -- FGI 42-64 | '0'B (Undefined) | | |
| fdd-Add-UE-EUTRA-Capabilities-r9 SEQUENCE { | | | |
| phyLayerParameters-r9 | Not checked | | |
| featureGroupIndicators-r9 | Shall be set according to the corresponding PICS items. Checked. See Note 1. | BITSTRING 32 | |
| -- FGI 1_F | Checked | | |
| -- FGI 2_F | Checked | | |
| -- FGI 3_F | Checked | | FDD = TDD |
| -- FGI 4_F | Checked | | |
| -- FGI 5_F | Checked | | FDD = TDD |
| -- FGI 6_F | Checked | | FDD = TDD |
| -- FGI 7_F | Checked | | FDD = TDD |
| -- FGI 8_F | Checked | | |
| -- FGI 9_F | Checked | | |
| -- FGI 10_F | Checked | | |
| -- FGI 11_F | Checked | | |
| -- FGI 12_F | Checked | | |
| -- FGI 13_F | Checked | | FDD = TDD |
| -- FGI 14_F | Checked | | FDD = TDD |
| -- FGI 15_F | Checked | | |
| -- FGI 16_F | Checked | | |
| -- FGI 17_F | Checked | | FDD = TDD |
| -- FGI 18_F | Checked | | FDD = TDD |
| -- FGI 19_F | Checked | | |
| -- FGI 20_F | Checked | | FDD = TDD |
| -- FGI 21_F | Checked | | FDD = TDD |
| -- FGI 22_F | Checked | | |
| -- FGI 23_F | Checked | | |
| -- FGI 24_F | Checked | | |
| -- FGI 25_F | Checked | | FDD = TDD |
| -- FGI 26_F | Checked | | |
| -- FGI 27_F | Checked | | |
| -- FGI 28_F | Checked | | |

| | | | |
|--------------------------------------|--|--------------|--------------|
| -- FGI 29_F | Checked | | |
| -- FGI 30_F | Checked | | FDD = TDD |
| -- FGI 31_F | Checked | | |
| -- FGI 32_F | '0'B (Undefined) | | |
| featureGroupIndRel9Add-r9 | Shall be set according to the corresponding PICS items. Checked. See Note 1. | BITSTRING 32 | |
| -- FGI 33_F | Checked | | |
| -- FGI 34_F | Checked | | |
| -- FGI 35_F | Checked | | |
| -- FGI 36_F | Checked | | |
| -- FGI 37_F | Checked | | |
| -- FGI 38_F | Checked | | |
| -- FGI 39_F | Checked | | |
| -- FGI 40_F | Checked | | |
| -- FGI 41_F | Checked | | |
| -- FGI 42-64_F | '0'B (Undefined) | | |
| interRAT-ParametersGERAN-r9 | Not checked | | |
| interRAT-ParametersUTRA-r9 | Not checked | | |
| interRAT-ParametersGERAN-r9 | Not checked | | |
| interRAT-ParametersCDMA2000-r9 | Not checked | | |
| neighCellSI-AcquisitionParameters-r9 | Not checked | | |
| } | | | |
| tdd-Add-UE-EUTRA-Capabilities-r9 | | | |
| SEQUENCE { | | | |
| phyLayerParameters-r9 | Not checked | | |
| featureGroupIndicators-r9 | Shall be set according to the corresponding PICS items. Checked. See Note 1. | BITSTRING 32 | |
| -- FGI 1_T | Checked | | |
| -- FGI 2_T | Checked | | |
| -- FGI 3_T | Checked | | FDD = TDD |
| -- FGI 4_T | Checked | | |
| -- FGI 5_T | Checked | | FDD = TDD |
| -- FGI 6_T | Checked | | FDD = TDD |
| -- FGI 7_T | Checked | | FDD = TDD |
| -- FGI 8_T | Checked | | |
| -- FGI 9_T | Checked | | |
| -- FGI 10_T | Checked | | |
| -- FGI 11_T | Checked | | |
| -- FGI 12_T | Checked | | |
| -- FGI 13_T | Checked | | FDD = TDD |
| -- FGI 14_T | Checked | | FDD = TDD |
| -- FGI 15_T | Checked | | |
| -- FGI 16_T | Checked | | |
| -- FGI 17_T | Checked | | FDD = TDD |
| -- FGI 18_T | Checked | | FDD = TDD |
| -- FGI 19_T | Checked | | |
| -- FGI 20_T | Checked | | FDD = TDD |
| -- FGI 21_T | Checked | | FDD = TDD |
| -- FGI 22_T | Checked | | |
| -- FGI 23_T | Checked | | |
| -- FGI 24_T | Checked | | |

| | | | |
|--------------------------------------|--|--------------|--------------|
| -- FGI 25_T | Checked | | FDD = TDD |
| -- FGI 26_T | Checked | | |
| -- FGI 27_T | Checked | | |
| -- FGI 28_T | Checked | | |
| -- FGI 29_T | Checked | | |
| -- FGI 30_T | Checked | | FDD = TDD |
| -- FGI 31_T | Checked | | |
| -- FGI 32_T | '0'B (Undefined) | | |
| featureGroupIndRel9Add-r9 | Shall be set according to the corresponding PICS items. Checked. See Note 1 | BITSTRING 32 | |
| -- FGI 33_T | Checked | | |
| -- FGI 34_T | Checked | | |
| -- FGI 35_T | Checked | | |
| -- FGI 36_T | Checked | | |
| -- FGI 37_T | Checked | | |
| -- FGI 38_T | Checked | | |
| -- FGI 39_T | Checked | | |
| -- FGI 40_T | Checked | | |
| -- FGI 41_T | Checked | | |
| -- FGI 42-64_T | '0'B (Undefined) | | |
| interRAT-ParametersGERAN-r9 | Not checked | | |
| interRAT-ParametersUTRA-r9 | Not checked | | |
| interRAT-ParametersGERAN-r9 | Not checked | | |
| interRAT-ParametersCDMA2000-r9 | Not checked | | |
| neighCellSI-AcquisitionParameters-r9 | Not checked | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | | | |
| interRAT-ParametersUTRA-v9c0 | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| phyLayerParameters-v9d0 | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| rf-Parameters-v9e0 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | Not checked | | |
| } | Not checked | | |
| } | Not checked | | |
| } | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| ue-Category-v1020 | Checked against UE Category indications in the PICS and requirements from 36.306 cl. 4.1 | | |
| phyLayerParameters-v1020 | Not checked | | |
| rf-Parameters-v1020{ | Not checked | | |
| supportedBandCombination-r10 { | For as many band combinations as supported | | |
| BandCombinationParameters-r10 { | | | |
| BandParameters-r10 { | | | |
| bandEUTRA-r10 { | Not checked | | |
| } | | | |
| BandParameterUL-r10 { | | | |
| CA-MIMO-ParametersUL-r10 { | For as many bandwidth classes as supported | | |
| ca-BandwidthClassUL-r10 | Not checked | | |
| supportedMIMO-CapabilityUL-r10 | Not checked | | |
| } | | | |
| } | | | |
| BandParameterDL-r10 { | For as many bandwidth classes as supported | | |
| CA-MIMO-ParametersDL-r10 { | | | |

| | | | |
|-------------------------------------|--|--------------|--|
| ca-BandwidthClassDL-r10 | Not checked | | |
| supportedMIMO-CapabilityDL-r10 | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| measParameters-v1020 { | Not checked | | |
| bandCombinationListEUTRA-r10 { | For as many band combinations as supported | | |
| BandInfoEUTRA { | | | |
| interFreqBandList { | | | |
| InterFreqBandInfo { | | | |
| interFreqNeedForGaps | Not checked | | |
| } | | | |
| interRAT-BandList { | | | |
| InterRAT-BandInfo { | | | |
| interRAT-NeedForGaps | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| featureGroupIndRel10-r10 | Shall be set according to the corresponding PICS items. Checked. | BITSTRING 32 | |
| -- FGI 101 | Checked | | |
| -- FGI 102 | Checked | | |
| -- FGI 103 | Checked | | |
| -- FGI 104 | Checked | | |
| -- FGI 105 | Checked | | |
| -- FGI 106 | Checked | | |
| -- FGI 107 | Checked | | |
| -- FGI 108 | Checked | | |
| -- FGI 109 | Checked | | |
| -- FGI 110 | Checked | | |
| -- FGI 111 | Checked | | |
| -- FGI 112 | Checked | | |
| -- FGI 113 | Checked | | |
| -- FGI 114 | Checked | | |
| -- FGI 115 | Checked | | |
| -- FGI 116 | Checked | | |
| -- FGI 117-132 | '0'B (Undefined) | | |
| interRAT-ParametersCDMA2000-v1020 | Not checked | | |
| ue-BasedNetwPerfMeasParameters-r10 | Not checked | | |
| interRAT-ParametersUTRA-TDD-v1020 | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| fdd-Add-UE-EUTRA-Capabilities-v1060 | Not checked | | |
| tdd-Add-UE-EUTRA-Capabilities-v1060 | Not checked | | |
| rf-Parameters-v1060 | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| rf-Parameters-v1090 | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| pdcp-Parameters-v1130 | Not checked | | |
| phyLayerParameters-v1130 | Not checked | | |
| rf-Parameters-v1130 | Not checked | | |
| measParameters-v1130 | Not checked | | |
| interRAT-ParametersCDMA2000- | Not checked | | |
| v1130 | | | |
| otherParameters-r11 | Not checked | | |
| fdd-Add-UE-EUTRA-Capabilities-v1130 | Not checked | | |
| tdd-Add-UE-EUTRA-Capabilities-v1130 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |

| | | | |
|---|--|--|--|
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---|
| Rel-8 | Only for Rel-8 |
| >Rel-8 | For Rel-9 or later Releases |
| ROHC | Support of ROHC profile0x0001 and ROHC profile0x0002 (TS 36.523-2 A.4.4-1/40 and A.4.4-1/41). |
| FDD = TDD | UE is not allowed to signal different values for FDD and TDD |
| Note 1: | For Rel-9, if FDD or TDD specific FGIs are not signalled it is checked that the corresponding FDD or TDD specific PICS items are consistent with the common PICS items. For Rel-10, if featureGroupIndicators (i.e. Rel-8 FGIs) or featureGroupIndicators-r9 (i.e. Rel-9 FGIs) or featureGroupIndRel9Add-r9 (i.e. both, common Rel-9 FGIs and FDD or TDD specific Rel-9 FGIs) are not signalled, it is checked that the corresponding PICS items indicate support of the non-signalled FGIs. |

Table 8.5.4.1.3.3-3: UEcapabilityEnquiry (step 19a1, Table 8.5.4.1.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-22 | | | |
|---|---|---|--|
| Information Element | Value/Remark | Comment | Condition |
| UECapabilityEnquiry ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueCapabilityEnquiry-r8 SEQUENCE { | Numbering of entries is according to conditions met | According to inter-RAT capabilities of UE | |
| ue-RadioAccessCapRequest[i1] | utran | This entry is present if the UE is capable of any mode (FDD/TDD) in UMTS. | pc_FDD, pc_TDD_H CR, pc_TDD_L CR, pc_TDD_V HCR |
| ue-RadioAccessCapRequest[i2] | geran-cs | | pc_GERAN and pc_CS |
| ue-RadioAccessCapRequest[i3] | geran-ps | | pc_GERAN and pc_PS |
| ue-RadioAccessCapRequest[i4] | cdma2000-1XR TT | | pc_1xRTT, pc_HRPD |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.5.4.1.3.3-4: UECapabilityInformation (step 19a2, Table 8.5.4.1.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-23 | | | |
|--|--------------------------------------|--|--|
| Information Element | Value/Remark | Comment | Condition |
| UECapabilityInformation ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueCapabilityInformation-r8 SEQUENCE { SIZE (1..maxRAT-Capabilities)) OF SEQUENCE { | | Stated capability shall be compatible with 3GPP TS 36.523-2 (ICS statements) and the user settings | |
| rat-Type[i1] | utran | | pc_FDD, pc_TDD_HCR, pc_TDD_LCR, pc_TDD_VHCR |
| ueCapabilitiesRAT-Container[i1] OCTET STRING {} | ueCapabilitiesRAT-Container-UTRAN | Encoded as an INTER RAT HANDOVER INFO messages as defined in 3GPP TS 25.331 [17]. | pc_FDD, pc_TDD_HCR, pc_TDD_LCR, pc_TDD_VHCR |
| rat-Type[i2] | geran-cs | | pc_GERAN and pc_CS |
| ueCapabilitiesRAT-Container [i2] OCTET STRING {} | ueCapabilitiesRAT-Container-GERAN-CS | Encoded as the concatenation of IEs MS classmark 2 and MS classmark 3 as defined in 3GPP TS 24.008 [32]. | pc_GERAN and pc_CS |
| rat-Type[i3] | geran-ps | | pc_GERAN and pc_PS |
| ueCapabilitiesRAT-Container [i3] OCTET STRING {} | ueCapabilitiesRAT-Container-GERAN-PS | Encoded as MS radio access capability IE as defined in 3GPP TS 24.008 [32]. | pc_GERAN and pc_PS |
| rat-Type[i4] | cdma2000-1XRTT | | pc_1xRTT, pc_HRPD |
| ueCapabilitiesRAT-Container [i4] OCTET STRING {} | Not checked | Encoded as A21 Mobile Subscription Information as defined in 3GPP2 A.S0008-C v4.0 [33]. | pc_1xRTT, pc_HRPD |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.5.4.1.3.3-5: ueCapabilitiesRAT-Container-UTRAN

| Derivation path: 25.331 clause 11.2 | | | |
|--|-------------------------------|--|-------------------|
| Information Element | Value/Remark | Comment | Condition |
| ueCapabilitiesRAT-Container-UTRAN ::= SEQUENCE { | | | |
| predefinedConfigStatusList CHOICE { | | | |
| absent | NULL | | |
| } | | | |
| uE-SecurityInformation | Not checked | The value of start CS is not used for LTE to UMTS handover in Rel-8 | |
| ue-CapabilityContainer CHOICE { | | | |
| present | Not checked | Container including UE radio access capability | |
| } | | | |
| v390NonCriticalExtensions CHOICE { | | | |
| present SEQUENCE { | | | |
| interRATHandoverInfo-v390ext | Not checked | Positioning capability and dummy field | |
| v3a0NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v3a0ext | Not checked | Positioning capability | |
| laterNonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v3d0ext | Not checked | Deprecated information | |
| interRATHandoverInfo-r3-add-ext | Not checked if present | UE radio access capability for bands VIII to XIV, UE radio access capability extension, support of 2 DRX schemes in CELL_PCH, support of E-DPDCH power interpolation | |
| v3g0NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v3g0ext | Not checked | Positioning capability extension | |
| v4b0NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v4b0ext | Checked | Access Stratum Release indicator | |
| v4d0NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v4d0ext | Not checked if present | LCR TDD UE capability | |
| v590NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v590ext | Not checked if present | Predefined configuration status information compressed, UE radio access capability compressed | |
| v690NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v690ext | | | |
| SEQUENCE { | | | |
| ue-SecurityInformation2 | Present but value not checked | START PS | pc_Featr Grp_8 |
| ue-SecurityInformation2 | Not present | | NOT pc_FeatrGrp_8 |

| | | | |
|--|-------------------------------|--|-----------------|
| ue-RadioAccessCapabilityComp | Not checked | RF capability for bands VIII to XIV | |
| ue-RadioAccessCapabilityComp2 | Present but value not checked | UE radio access capability comp 2 | pc_FDD |
| ue-RadioAccessCapabilityComp2 | Not checked if present | UE radio access capability comp 2 | NOT pc_FDD |
| } | | | |
| v6b0NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v6b0ext | Not checked if present | Support for SIB11bis | |
| v6e0NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v6e0ext | Not checked if present | Support of FDPCH | |
| v770NonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v770ext | Not checked if present | TDD RF and physical channel capability extensions in Rel-7, support of GANSS, support of MAC-ehs, LCR TDD UE specific capability information | |
| v790nonCriticalExtensions SEQUENCE { | | | |
| interRATHandoverInfo-v790ext | Not checked if present | Support of E-DPCCH power boosting | |
| v860NonCriticalExtensions0 SEQUENCE { | | | |
| interRATHandoverInfo-v860ext | Not checked if present | UE radio access capability for additional bands, Rel-8 HS-DSCH physical layer category, support of MAC-iis | |
| v880NonCriticalExtensions SEQUENCE { | Present but value not checked | | pc_TDD_L CR |
| v880NonCriticalExtensions SEQUENCE { | Not checked if present | | NOT pc_TDD_L CR |
| v920NonCritical ExtensionsinterRATHandoverInfo-v880ext | Not checked | Support for priority reselection in UTRAN, Rel-8 radio access capability extensions for LCR TDD (e.g. multi-carrier operation) | |
| SEQUENCE { | Not checked if present | | |
| interRATHandoverInfo-v920ext | Not checked if present | | |
| v8b0NonCritical Extensions SEQUENCE { | Present but value not checked | | pc_TDD_L CR |
| v8b0NonCritical Extensions SEQUENCE { | Not checked if present | | NOT pc_TDD_L CR |
| interRATHandoverInfo-v8b0ext | Not checked if present | | |
| v950NonCritical Extensions SEQUENCE { | | | |
| interRATHandoverInfo-v950ext | Not checked if present | | |

| | | | | |
|-------------|----------------------------|------------------------|--|--|
| SEQUENCE { | va40NonCritical Extensions | | | |
| va40ext | interRATHandoverInfo- | Not checked if present | | |
| SEQUENCE {} | nonCritical Extensions | | | |
| | } | | | |
| | } | | | |
| | } | | | |
| | SEQUENCE {} | | | |
| | } | | | |
| | } | | | |
| | } | | | |
| | } | | | |
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| | } | | | |
| | } | | | |
| | } | | | |
| | } | | | |
| | } | | | |
| | } | | | |
| | } | | | |
| | } | | | |

Table 8.5.4.1.3.3-6: ueCapabilitiesRAT-Container-GERAN-CS

| Derivation path: 25.331 clause 11.2 | | | |
|-------------------------------------|--|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Mobile Station Classmark 2 | First byte is 33H Second byte is 3. Third, Fourth and Fifth bytes are ignored. | | |
| Mobile Station Classmark 3 | CSN.1 decoding shall be successful and the contents shall indicate that E-UTRA FDD or EUTRA TDD or both is supported. Other values are not checked. | | |

Table 8.5.4.1.3.3-7: ueCapabilitiesRAT-Container-GERAN-PS

| Derivation path: 25.331 clause 11.2 | | | |
|-------------------------------------|--|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| MS Radio Access Capability | CSN.1 decoding shall be successful and the contents shall indicate that E-UTRA FDD or EUTRA TDD or both is supported. Other values are not checked. | | |

8.6 Minimization of Drive Test Specific Procedures

8.6.1 Immediate MDT

8.6.1.1 Immediate MDT / Reporting / Location information

8.6.1.1.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and measurement with event A2 configured with
includeLocationInfo included in the reportConfig }
ensure that {
  when { Entry condition for event A2 is met and detailed location information that has not been
reported is available }
  then { UE sends MeasurementReport message with locationInfo included }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state and measurement configured for event A2 }
ensure that {
  when { Exit condition for event A2 is met }
  then { UE stops sending MeasurementReport message }
}
```

8.6.1.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 36.331, clauses 5.3.5.3, 5.5.4.1, 5.5.4.3 and 5.5.5.

[TS 36.331, clause 5.3.5.3]

If the *RRCConnectionReconfiguration* message does not include the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

...

- 1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:
- 2> perform the measurement configuration procedure as specified in 5.5.2;

...

[TS 36.331, clause 5.5.4.1]

The UE shall:

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - ...
 - 2> else:
 - 3> if the corresponding *measObject* concerns EUTRA:
 - 4> consider any neighbouring cell detected on the associated frequency to be applicable when the concerned cell is not included in the *blackCellsToAddModList* defined within the *VarMeasConfig* for this *measId*;

...

- 2> if the *triggerType* is set to 'event' and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable cells for all measurements after layer 3 filtering taken during *timeToTrigger* defined for this event within the *VarMeasConfig* while the *VarMeasReportList* does not include a measurement reporting entry for this *measId* (a first cell triggers the event):

- 3> include a measurement reporting entry within the *VarMeasReportList* for this *measId*;
- 3> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;
- 3> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the *triggerType* is set to 'event' and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable cells not included in the *cellsTriggeredList* for all measurements after layer 3 filtering taken during *timeToTrigger* defined for this event within the *VarMeasConfig* (a subsequent cell triggers the event):
 - 3> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;
 - 3> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the *triggerType* is set to 'event' and if the leaving condition applicable for this event is fulfilled for one or more of the cells included in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId* for all measurements after layer 3 filtering taken during *timeToTrigger* defined within the *VarMeasConfig* for this event:
 - 3> remove the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> if *reportOnLeave* is set to *TRUE* for the corresponding reporting configuration:
 - 4> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 3> if the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId* is empty:
- 4> remove the measurement reporting entry within the *VarMeasReportList* for this *measId*;
- 4> stop the periodical reporting timer for this *measId*, if running;
- ...
- 2> upon expiry of the periodical reporting timer for this *measId*:
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- ...

NOTE 2: The UE does not stop the periodical reporting with *triggerType* set to 'event' or to 'periodical' while the corresponding measurement is not performed due to the serving cell RSRP being equal to or better than *s-Measure* or due to the measurement gap not being setup.

...

[TS 36.331, clause 5.5.4.3]

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A2-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A2-2, as specified below, is fulfilled;

InequalityA2-1 (Entering condition)

$$Ms + Hys < Thresh$$

InequalityA2-2 (Leaving condition)

$$M_s - H_{ys} > Thresh$$

The variables in the formula are defined as follows:

M_s is the measurement result of the serving cell, not taking into account any offsets.

H_{ys} is the hysteresis parameter for this event (i.e. *hysteresis* as defined within the *reportConfigEUTRA* for this event).

Thresh is the threshold parameter for this event (i.e. *a2-Threshold* as defined within the *reportConfigEUTRA* for this event).

M_s is expressed in dBm in case of RSRP, or in dB in case of RSRQ.

H_{ys} is expressed in dB.

Thresh is expressed in the same unit as ***M_s***.

[TS 36.331, clause 5.5.5]

...

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

1> set the *measId* to the measurement identity that triggered the measurement reporting;

1> set the *measResultServCell* to include the quantities of serving cell;

1> if there is at least one applicable neighbouring cell to report :

...

1> if the *includeLocationInfo* is configured in the corresponding *reportConfig* for this *measId* and detailed location information that has not been reported is available, set the content of the *locationInfo* as follows:

2> include the *locationCoordinates*;

2> if available, include the *gnss-TOD-msec*;

1> increment the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* by 1;

1> stop the periodical reporting timer, if running;

1> if the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* is less than the *reportAmount* as defined within the corresponding *reportConfig* for this *measId* :

2> start the periodical reporting timer with the value of *reportInterval* as defined within the corresponding *reportConfig* for this *measId*;

...

1> submit the *MeasurementReport* message to lower layers for transmission, upon which the procedure ends.

8.6.1.1.3 Test description

8.6.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1

Preamble:

- 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 36.509 [25] , if supported by the UE according to *pc_UpdateUE_LocationInformation*. Otherwise, or in addition any other suitable method may also be used.

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

8.6.1.1.3.2 Test procedure sequence

Table 8.6.1.1.3.2-1 illustrates the downlink power levels to be applied for Cell 1 at various time instants of the test execution. Row marked "T0" denotes the conditions after the preamble, while rows marked "T1" and "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.1.1.3.2-1: Power levels

| | Parameter | Unit | Cell 1 | Remark |
|-------|--|------------|--------|---|
| T0 | Cell-specific RS EPRE | dBm/15 kHz | -70 | Power level is such that $M_s > Thresh + Hys$ |
| T1 | | | -96 | Power level is such that entry condition for event A2 is satisfied $M_s + Hys < Thresh$ |
| T2 | | | -70 | Power level is such that exit condition for event A2 is satisfied $M_s > Thresh + Hys$ |
| Note: | The total tolerance used is the sum of downlink signal level uncertainty (TS 36.508 clause 6.2.2.1) and absolute UE measurement accuracy (TS 36.133 clause 9). | | | |

Table 8.6.1.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message including <i>measConfig</i> to setup intra LTE measurement and reporting for event A2 with <i>includeLocationInfo</i> configured. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS re-adjusts the cell-specific reference signal level according to row "T1" in table 8.6.1.1.3.2-1. | - | - | - | - |
| 4 | Check: Does the UE transmit a <i>MeasurementReport</i> message to report event A2 with the UE <i>locationInfo</i> included? | --> | <i>MeasurementReport</i> | 1 | P |
| 5 | The SS re-adjusts the cell-specific reference signal level according to row "T2" in table 8.6.1.1.3.2-1. | - | - | - | - |
| 6 | Wait and ignore <i>MeasurementReport</i> messages for 5 s to allow change of power levels for Cell 1. | - | - | - | - |
| 7 | Check: Does the UE attempt to transmit an uplink message within the next 10s? | - | - | 2 | F |

8.6.1.1.3.3 Specific message contents

Table 8.6.1.1.3.3-1: *RRCConnectionReconfiguration* (step 1, Table 8.6.1.1.3.2-2)

| |
|--|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-8 with condition MEAS |
|--|

Table 8.6.1.1.3.3-2: *MeasConfig* (step 1, Table 8.6.1.1.3.2-2)

| Derivation path: 36.508 clause 4.6.6 table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| measConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A2 | | |
| reportConfig[1] | ReportConfig-A2-H | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A2 | | |
| } | | | |
| } | | | |

Table 8.6.1.1.3.3-3: *ReportConfig-A2-H* (step 1, Table 8.6.1.1.3.2-2)

| Derivation path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-83) | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| ReportConfigEUTRA ::= SEQUENCE { | | | |
| triggerType CHOICE { | | | |
| event SEQUENCE { | | | |
| hysteresis | 6 | 3 dB | |
| } | | | |
| } | | | |
| reportAmount | r1 | | |
| includeLocationInfo-r10 | true | | |
| } | | | |

Table 8.6.1.1.3.3-4: *MeasurementReport* (step 4, Table 8.6.1.1.3.2-2)

| Derivation path: 36.508 table clause 4.6.1 table 4.6.1-5 | | | |
|--|-------------------|---------------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults ::= SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell ::= SEQUENCE { | | Report Cell 1 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE {} | Not present | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 SEQUENCE { | | | |
| locationCoordinates-r10 CHOICE { | | | |
| ellipsoid-Point-r10 | Any allowed value | | |
| ellipsoidPointWithAltitude-r10 | Any allowed value | | |
| } | | | |
| } | | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.1.2 Immediate MDT / Reporting / Location information / Request from eNB / Event A2

8.6.1.2.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRA RRC_CONNECTED state and measurement configured for event A2 with the
includeLocationInfo set to true and the obtainLocation set to setup }
ensure that {
  when { Serving cell becomes worse than absolute threshold minus hysteresis }
  then { UE sends MeasurementReport message with the locationInfo obtained after receiving
RRCConnectionReconfiguration message }
}

```

8.6.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.3.10.9 and 5.5.5.

[TS 36.331, clause 5.3.10.9]

The UE shall:

...

1> if the received *otherConfig* includes the *obtainLocation*:

2> attempt to have detailed location information available for any subsequent measurement report;

NOTE: The UE is requested to attempt to have valid detailed location information available whenever sending a measurement report for which it is configured to include available detailed location information. The UE may not succeed e.g. because the user manually disabled the GPS hardware, due to no/poor satellite coverage. Further details, e.g. regarding when to activate GNSS, are up to UE implementation.

[TS 36.331, clause 5.5.5]

The purpose of this procedure is to transfer measurement results from the UE to E-UTRAN.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

...

- 1> if the *includeLocationInfo* is configured in the corresponding *reportConfig* for this *measId* and detailed location information that has not been reported is available, set the content of the *locationInfo* as follows:
 - 2> include the *locationCoordinates*;
 - 2> if available, include the *gnss-TOD-msec*;

8.6.1.2.3 Test description

8.6.1.2.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

None.

Preamble:

- 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 36.509 [25], if supported by the UE according to *pc_UpdateUE_LocationInformation*. Otherwise, or in addition any other suitable method may also be used.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.1.2.3.2 Test procedure sequence

Table 8.6.1.2.3.2-1 illustrates the downlink power levels to be applied for the cell 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.1.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Remark |
|----|-----------------------|------------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -70 | The power level value is such that measurement result for Cell 1 satisfies leaving condition for event A2 ($M_s - Hys > Thresh$). |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -96 | The power level value is such that measurement result for Cell 1 satisfies entering condition for event A2 ($M_s + Hys < Thresh$). |

Table 8.6.1.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|--|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup intra-frequency measurement for event A2 with <i>includeLocationInfo</i> set to <i>true</i> . | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 power level according to the row "T1" in table 8.6.1.2.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message to report event A2 with <i>locationInfo</i> . (Note 1) | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 1 power level according to the row "T0" in table 8.6.1.2.3.2-1. | - | - | - | - |
| 6 | The SS waits 10s. | - | - | - | - |
| 7 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to modify intra-frequency measurement for event A2 with <i>includeLocationInfo</i> set to <i>true</i> and <i>obtainLocation</i> set to <i>setup</i> . | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 8 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 9 | The SS waits [60s] to ensure that the UE has detailed location information available. (NOTE 2) | - | - | - | - |
| 10 | The SS changes Cell 1 power level according to the row "T1" in table 8.6.1.2.3.2-1. | - | - | - | - |
| 11 | Check: Does the UE transmit a <i>MeasurementReport</i> message to report event A2 with <i>locationInfo</i> ? | --> | <i>MeasurementReport</i> | 1 | P |
| NOTE 1: The UE reports the detailed location information available stored in the UE. This intends to check that detailed location information reported in step 11 is obtained after receiving the <i>RRCConnectionReconfiguration</i> message in step 7. | | | | | |
| NOTE 2: Depending on UE's positioning engine used in this test case, any suitable method (e.g. test function Update UE Location Information defined in TS 36.509 [25]) may be used in this step to provide the position to the UE. | | | | | |

8.6.1.2.3.3 Specific message contents

Table 8.6.1.2.3.3-1: *RRCConnectionReconfiguration* (step 1, Table 8.6.1.2.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8 with condition MEAS |
|--|

Table 8.6.1.2.3.3-2: *MeasConfig* (Table 8.6.1.2.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE{ | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfig[1] | IdReportConfig-A2 | | |
| reportConfig[1] | ReportConfigEUTRA-A2-RECONF | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfig[1] | IdReportConfig-A2 | | |
| } | | | |
| } | | | |

Table 8.6.1.2.3.3-3: *ReportConfigEUTRA-A2-RECONF* (Table 8.6.1.2.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-5 ReportConfigEUTRA-A2(-83) | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ReportConfigEUTRA ::= SEQUENCE { | | | |
| triggerType CHOICE { | | | |
| event SEQUENCE { | | | |
| hysteresis | 6 | 3dB | |
| } | | | |
| } | | | |
| si-RequestForHO-r9 | Not present | | |
| ue-RxTxTimeDiffPeriodical-r9 | Not present | | |
| includeLocationInfo-r10 | true | | |
| reportAddNeighMeas-r10 | Not present | | |
| } | | | |

Table 8.6.1.2.3.3-4: MeasurementReport (steps 4 and 11, Table 8.6.1.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|-------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells | Not present | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Any allowed value | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.1.2.3.3-5: RRCConnectionReconfiguration (step 7, Table 8.6.1.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 with condition MEAS | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| otherConfig-r9 SEQUENCE { | | | |
| reportProximityConfig-r9 | Not present | | |
| idc-Config-r11 | Not present | | |
| powerPrefIndicationConfig-r11 | Not present | | |
| obtainLocationConfig-r11 SEQUENCE { | | | |
| obtainLocation-r11 | setup | | |
| } | | | |
| } | | | |
| fullConfig-r9 | Not present | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.1.2.3.3-6: *MeasConfig* (Table 8.6.1.2.3.3-5)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>MeasConfig</i> ::= SEQUENCE { | | | |
| <i>reportConfigToAddModList</i> SEQUENCE (SIZE (1.. <i>maxReportConfigId</i>)) OF SEQUENCE { | 1 entry | | |
| <i>reportConfigId</i> [1] | <i>IdReportConfig-A2</i> | | |
| <i>reportConfig</i> [1] | <i>ReportConfigEUTRA-A2-RECONF2</i> | | |
| } | | | |
| } | | | |

Table 8.6.1.2.3.3-7: *ReportConfigEUTRA-A2-RECONF2* (Table 8.6.1.2.3.3-6)

| Derivation Path: 36.508, Table 4.6.6-5 <i>ReportConfigEUTRA-A2</i> (-83) | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>ReportConfigEUTRA</i> ::= SEQUENCE { | | | |
| <i>triggerType</i> CHOICE { | | | |
| event SEQUENCE { | | | |
| <i>hysteresis</i> | 4 | 2dB | |
| } | | | |
| } | | | |
| <i>si-RequestForHO-r9</i> | Not present | | |
| <i>ue-RxTxTimeDiffPeriodical-r9</i> | Not present | | |
| <i>includeLocationInfo-r10</i> | true | | |
| <i>reportAddNeighMeas-r10</i> | Not present | | |
| } | | | |

8.6.2 Logged MDT

8.6.2.1 Logged MDT / Intra-frequency measurement, logging and reporting

8.6.2.1.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state camping normally on an E-UTRA cell where logged measurement is
configured without areaConfiguration and the UE is able to detect an E-UTRA intra-frequency cell }
ensure that {
  when { T330 is running }
  then { UE is logging serving cell idle mode measurements and Intra-frequency neighbouring cell
measurements }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has one or more logged Intra-frequency neighbouring
cell measurement entries stored in VarLogMeasReport stored and the plmn-Identity stored in
VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving RRCConnectionSetup message }
  then { UE includes the logMeasAvailable IE in the RRCConnectionSetupComplete message }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has logged Intra-frequency neighbouring cell
measurements available for E-UTRA and plmn-Identity stored in VarLogMeasReport is equal to the RPLMN
}
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with a logMeasReport with Intra-frequency
neighbouring cell measurements }
}
```

(4)

```

with { UE in E-UTRA RRC_CONNECTED state and UE has logged measurements available for E-UTRA and
plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with absoluteTimeStamp set equal to the value
configured when the logged measurement configuration was received and a relativeTimeStamp for each
logged measurement indicating the elapsed time since the logged measurement configuration was
received }
}

```

(5)

```

with { UE in E-UTRA RRC_CONNECTED state and UE has logged measurements available for E-UTRA and
plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with traceReference, traceRecordingSessionRef
and tce-Id being set to same values as configured when the logged measurement configuration was
received }
}

```

8.6.2.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.304, clause 8; TS 36.331, clauses 5.3.5.3, 5.5.4.1, 5.5.4.2 and 5.5.5.

[TS 36.304, clause 8 (TP1)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 36.331, clause 5.3.3.4 (TP2)]

The UE shall:

...

1> set the content of *RRCCConnectionSetupComplete* message as follows:

...

- 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include *logMeasAvailable*;
- 2> submit the *RRCCConnectionSetupComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3 (TP3, TP4, TP5)]

Upon receiving the *UEInformationRequest* message, the UE shall

...

- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
 - 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.6.3 (TP1, TP4, TP5)]

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;
- 1> store the RPLMN as *plmn-Identity* in *VarLogMeasReport*;
- 1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;
- 1> start timer T330 with the timer value set to the *loggingDuration*;

[TS 36.331, clause 5.6.8.2 (TP1, TP4)]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;

- 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
- 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;
- NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
- 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS 36.331, clause 6.2.2 (TP1)]

– LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
    criticalExtensions          CHOICE {
        c1                     CHOICE {
            loggedMeasurementConfiguration-r10    LoggedMeasurementConfiguration-r10-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture          SEQUENCE {}
    }
}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
    traceReference-r10          TraceReference-r10,
    traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
    tce-Id-r10                  OCTET STRING (SIZE (1)),
    absoluteTimeInfo-r10       AbsoluteTimeInfo-r10,
    areaConfiguration-r10      AreaConfiguration-r10          OPTIONAL, -- Need OR
    loggingDuration-r10        LoggingDuration-r10,
    loggingInterval-r10        LoggingInterval-r10,
    nonCriticalExtension        SEQUENCE {}                  OPTIONAL  -- Need OP
}
-- ASN1STOP
```

| <i>LoggedMeasurementConfiguration</i> field descriptions |
|---|
| <i>absoluteTimeInfo</i> Indicates the absolute time in the current cell. |
| <i>tce-Id</i> Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| <i>traceRecordingSessionRef</i> Parameter Trace Recording Session Reference: See TS 32.422 [58] |

8.6.2.1.3 Test description

8.6.2.1.3.1 Pre-test conditions

System Simulator:

- Two intra-frequency cells belonging to the same PLMN, but to different tracking areas: Cell 1, Cell 11
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed
- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of intra-frequency neighbouring cell list in SIB4 set as defined in TS 36.508 [18] table 6.3.1.1-1.

Preamble:

- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.2.1.3.2 Test procedure sequence

Table 8.6.2.1.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" is applied at the point indicated in the Main behaviour description in Table 8.6.2.1.3.2-2.

Table 8.6.2.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 11 | Remark |
|-----------|-----------------------|---------------|--------|---------|---|
| T1 | Cell-specific RS EPRE | dBm/ 15kHz | -85 | -79 | The power level values are assigned to satisfy $R_{Cell\ 1} < R_{Cell\ 11}$. |

Table 8.6.2.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|--|---|------------------|--|-------------|---------|
| | | U - S | Message | | |
| 1 | SS transmits a <i>LoggedMeasurementConfiguration</i> message including to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 11 levels according to the row "T1" in table 8.6.2.1.3.2-1. (Note 1) | - | - | - | - |
| 5 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 11 to initiate a tracking area update procedure. (Note 1) | --> | <i>RRCConnectionRequest</i> | - | - |
| 6 | SS transmit an <i>RRCConnectionSetup</i> message. | <-- | RRC: <i>RRCConnectionSetup</i> | - | - |
| 7 | Check: Does the UE include the IE <i>logMeasAvailable</i> in the <i>RRCConnectionSetupComplete</i> message? | --> | RRC: <i>RRCConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST | 2 | P |
| 8-10 | Steps 4 to 6 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 11. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 11-19 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 11. | - | - | - | - |
| 20 | The SS transmits a <i>UEInformationRequest</i> message on Cell 11. | <-- | <i>UEInformationRequest</i> | - | - |
| 21 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with the IEs <i>absoluteTimeStamp</i> , <i>traceReference-r10</i> , <i>traceRecordingSessionRef</i> and <i>tce-Id</i> set to same value as received in the <i>LoggedMeasurementConfiguration</i> message in step 1; and a <i>LogMeasInfoList</i> with at least two entries with serving cell idle mode measurements and where in at least one of the entries the IE <i>measResultListEUTRA</i> include a neighbouring cell measurement of Cell 11; and where the <i>relativeTimeStamp</i> is increased between the subsequent <i>LogMeasInfoList</i> entries by at least the value of configured <i>loggingInterval</i> in the received <i>LoggedMeasurementConfiguration</i> message in step 1. | --> | <i>UEInformationResponse</i> | 1,3, 4,5 | P |
| Note 1: The change of power levels is to trigger a cell re-selection procedure to make sure that the UE is logging neighbouring cell measurements (logging interval=2.56 seconds) of Cell 11 while t-Reselection timer is running (7 seconds). | | | | | |

8.6.2.1.3.3 Specific message contents

Table 8.6.2.1.3.3-1: SystemInformationBlockType3 for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-2 | | |
|--|--------------|---------|
| Information Element | Value/remark | Comment |
| SystemInformationBlockType3 ::= SEQUENCE { | | |
| intraFreqCellReselectionInfo SEQUENCE { | | |
| t-ReselectionEUTRA | 7 | seconds |
| } | | |
| } | | |

Table 8.6.2.1.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.2.1.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.1.3.3-3: RRCConnectionSetupComplete (step 7, Table 8.6.2.1.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| gummei-Type-r10 | Not checked | | |
| rlf-Info Available-r10 | Not checked | | |
| logMeas Available-r10 | TRUE | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.1.3.4: UEInformationRequest (step 20, Table 8.6.2.1.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|
| |

Table 8.6.2.1.3.3-5: UEInformationResponse (step 21, Table 8.6.2.1.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementCon figuration</i> in step 1 | | |

| | | | |
|---|---|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least 2 entries where at least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 11 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId [1] | Same as Cell 11 | | |
| cgi-Info [1] | Not checked | | |
| measResult [1] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r10 | Not present | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.2 Logged MDT / Inter-frequency measurement, logging and reporting

8.6.2.2.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state camping normally on an E-UTRA cell where logged
measurement is configured without areaConfiguration and the UE is able to detect an E-UTRA inter-
frequency cell }
ensure that {
  when { T330 is running }
  then { UE is logging Inter-frequency neighbouring cell measurements }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has one or more logged Inter-frequency neighbouring
cell measurement entries stored in VarLogMeasReport stored and the plmn-Identity stored in
VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with a logMeasReport with Inter-frequency
neighbouring cell measurements }
}
```

8.6.2.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.304, clause 8; TS 36.331, clauses 5.6.5.3, 5.6.6.3 and 5.6.8.2.

[TS 36.304, clause 8 (TP1)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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.

[TS36.331, clause 5.6.5.3 (TP2)]

[TS 36.331, clause 5.6.5.3 (TP3, TP4, TP5)]

Upon receiving the *UEInformationRequest* message, the UE shall

...

1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:

2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:

....

- 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
- 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS36.331, clause 5.6.6.3 (TP1)]

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;
- 1> store the RPLMN as *plmn-Identity* in *VarLogMeasReport*;
- 1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;
- 1> start timer T330 with the timer value set to the *loggingDuration*;

[TS36.331, clause 5.6.8.2 (TP1)]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
 - 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS36.331, clause 6.2.2 (TP1)]

– LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
    criticalExtensions          CHOICE {
        c1                      CHOICE {
            loggedMeasurementConfiguration-r10    LoggedMeasurementConfiguration-r10-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture          SEQUENCE {}
    }
}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
    traceReference-r10          TraceReference-r10,
    traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
    tce-Id-r10                  OCTET STRING (SIZE (1)),
    absoluteTimeInfo-r10       AbsoluteTimeInfo-r10,
    areaConfiguration-r10      AreaConfiguration-r10          OPTIONAL, -- Need OR
    loggingDuration-r10        LoggingDuration-r10,
    loggingInterval-r10        LoggingInterval-r10,
    nonCriticalExtension        SEQUENCE {}                  OPTIONAL -- Need OP
}
-- ASN1STOP
```

LoggedMeasurementConfiguration field descriptions

| | |
|--|---|
| <i>absoluteTimeInfo</i> | Indicates the absolute time in the current cell. |
| <i>tce-Id</i> | Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| <i>traceRecordingSessionRef</i> | Parameter Trace Recording Session Reference: See TS 32.422 [58] |

8.6.2.2.3 Test description

8.6.2.2.3.1 Pre-test conditions

System Simulator:

- Two inter-frequency cells belonging to the same PLMN, but to different tracking areas: Cell 1 and Cell 23
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed

- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of inter-frequency neighbouring cell list in SIB5 set as defined in TS 36.508 [18] table 6.3.1.2-1.

Preamble:

- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.2.2.3.2 Test procedure sequence

Table 8.6.2.2.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" is applied at the point indicated in the Main behaviour description in Table 8.6.2.2.3.2-2.

Table 8.6.2.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 23 | Remark |
|----|-----------------------|----------------|--------|---------|---|
| T1 | Cell-specific RS EPRE | dBm/15kHz z | -85 | -79 | The power level values are assigned to satisfy $R_{\text{Cell 1}} < R_{\text{Cell 23}}$. |

Table 8.6.2.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|--|--|------------------|---------------------------------------|-----|---------|
| | | U – S | Message | | |
| 1 | SS transmits a <i>LoggedMeasurementConfiguration</i> message including to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 23 levels according to the row "T1" in table 8.6.2.2.3.2-1. (Note 1) | - | - | - | - |
| 5-10 | Steps 1 to 6 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 23. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 11-19 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 20 | SS transmits a <i>UEInformationRequest</i> message. | <-- | <i>UEInformationRequest</i> | - | - |
| 21 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with a <i>LogMeasInfoList</i> with at least one neighbouring cell measurement of Cell 23. | --> | <i>UEInformationResponse</i> | 1,2 | P |
| Note 1: The change of power levels is to trigger the cell re-selection procedure to make sure that the UE is logging neighbouring cell measurements (logging interval=2.56 seconds) of Cell 23 while t-Reselection timer is running (7 seconds). | | | | | |

8.6.2.2.3.3 Specific message contents

Table 8.6.2.1.3.3-1: SystemInformationBlockType5 for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-4 | | |
|---|--------------|---------|
| Information Element | Value/remark | Comment |
| SystemInformationBlockType5 ::= SEQUENCE { | | |
| interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | |
| t-ReselectionEUTRA[1] | 7 | Seconds |
| } | | |
| } | | |

Table 8.6.2.2.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.2.2.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | Ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.2.3.3-3: UEInformationRequest (step 20, Table 8.6.2.2.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|
| |

Table 8.6.2.3.3-4: *UEInformationResponse* (step 21, Table 8.6.2.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Note checked | | |
| traceReference-r10SEQUENCE {} | Note checked | | |
| traceRecordingSessionRef-r10 | Note checked | | |
| tce-Id-r10 | Note checked | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least 1 entries where at least one entry complies to entry with index 'x' below. | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | Not checked | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 23 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId [1] | Same as Cell 23 | | |
| cgi-Info [1] | Not checked | | |
| measResult [1] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| } | | | |
| measResultListUTRA-r10 | Not present | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.3 Logged MDT / Logging and reporting / Limiting area scope

8.6.2.3.1 Test Purpose (TP)

(1)

with { UE received *LoggedMeasurementConfiguration* message with a *cellGlobalIdList* on a LTE cell}
ensure that {

```

when { UE camps on a LTE cell in the cellGlobalIdList}
then { UE performs logged measurements}
}

```

(2)

```

with { UE received LoggedMeasurementConfiguration message with a cellGlobalIdList on a LTE cell}
ensure that {
when { UE camps on a LTE cell not in the cellGlobalIdList}
then { UE does not perform logged measurements}
}

```

(3)

```

with { UE received LoggedMeasurementConfiguration message with a trackingAreaCodeList on a LTE cell}
ensure that {
when { UE camps on a LTE cell in the trackingAreaCodeList}
then { UE performs logged measurements }
}

```

(4)

```

with { UE received LoggedMeasurementConfiguration message with a trackingAreaCodeList on a LTE cell}
ensure that {
when { UE camps on a LTE cell not in the trackingAreaCodeList}
then { UE does not perform logged measurements }
}

```

8.6.2.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.304, clause 8; TS 36.331 clauses 5.6.6.3, 5.6.8.2, 6.3.4 and 6.3.6.

[TS 36.304, clause 8 (TP1,TP2,TP3,TP4)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 1: 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 36.331, clause 5.6.6.3 (TP1,TP2,TP3,TP4)]

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;
- 1> store the RPLMN as *plmn-Identity* in *VarLogMeasReport*;

1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;

1> start timer T330 with the timer value set to the *loggingDuration*;

[TS 36.331, clause 5.6.8.2 (TP1,TP2,TP3,TP4)]

While T330 is running, the UE shall:

1> perform the logging in accordance with the following:

2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:

3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;

2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:

3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;

3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:

4> include the *locationCoordinates*;

3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;

3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;

3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE 2: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS 36.331, clause 6.3.6 (TP1, TP2, TP3, TP4)]

The *AreaConfiguration* indicates area for which UE is requested to perform measurement logging. If not configured, measurement logging applies in the entire RPLMN of the UE at the point of receiving the configuration

AreaConfiguration information element

```
-- ASN1START
AreaConfiguration-r10 ::= CHOICE {
    cellGlobalIdList-r10      CellGlobalIdList-r10,
    trackingAreaCodeList-r10  TrackingAreaCodeList-r10
}
CellGlobalIdList-r10 ::= SEQUENCE (SIZE (1..32)) OF CellGlobalIdEUTRA
TrackingAreaCodeList-r10 ::= SEQUENCE (SIZE (1..8)) OF TrackingAreaCode
-- ASN1STOP
```

[TS 36.331, clause 6.3.4 (TP1,TP2)]

The IE *CellGlobalIdEUTRA* specifies the Evolved Cell Global Identifier (ECGI), the globally unique identity of a cell in E-UTRA.

CellGlobalIdEUTRA information element

```

-- ASN1START
CellGlobalIdEUTRA ::=
    plmn-Identity
    cellIdentity
}
SEQUENCE {
    PLMN-Identity,
    CellIdentity
}
-- ASN1STOP

```

[TS 36.331, clause 6.3.4 (TP3,TP4)]

The IE *TrackingAreaCode* is used to identify a tracking area within the scope of a PLMN, see TS 24.301 [35].

TrackingAreaCode information element

```

-- ASN1START
TrackingAreaCode ::=
    BIT STRING (SIZE (16))
-- ASN1STOP

```

8.6.2.3.3 Test description**8.6.2.3.3.1 Pre-test conditions**

System Simulator:

- Cell 1, Cell 2 and Cell 11.
- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18]

8.6.2.3.3.2 Test procedure sequence

Table 8.6.2.3.3.2-1 shows the cell configurations used during the test. The configuration T0 indicates the initial conditions. Subsequent configurations marked “T1”, “T2”, “T3” and “T4” are applied at the points indicated in the Main behaviour description in Table 8.6.2.3.3.2-2.

Table 8.6.2.3.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 11 | Comments |
|-----------|-----------|-----------|--------|--------|---------|---|
| T0 | RS EPRE | dBm/15kHz | -85 | -91 | -91 | Configure logged measurement with limiting area scope using <i>cellGlobaldList</i> |
| T1 | RS EPRE | dBm/15kHz | -91 | -91 | -85 | Verify that UE is perform logging of Cell 11 (TP1, Cell 11 is not configured in <i>cellGlobaldList</i>) |
| T2 | RS EPRE | dBm/15kHz | -91 | -85 | -91 | Verify that UE is not logging Cell 2 (TP2, Cell 2 is not configured in <i>cellGlobaldList</i>) and then re-configure logged measurement with limiting area scope using <i>trackingAreaCodeList</i> |
| T3 | RS EPRE | dBm/15kHz | -91 | -91 | -85 | Verify that UE is not perform logging of Cell 11 (TP4, Cell 11 not in configured <i>trackingAreaCodeList</i>) |
| T4 | RS EPRE | dBm/15kHz | -85 | -91 | -91 | Verify that UE is logging Cell 1 (TP3, Cell 2 is in configured <i>trackingAreaCodeList</i>) |

Table 8.6.2.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------------|---|------------------|---------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message with a <i>cellGlobalIdList</i> on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | SS transmits a <i>RRCCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCCConnectionRelease</i> | - | - |
| 3 | The SS changes Cell 1, Cell 2 and Cell 11 level according to the row "T1" in Table 8.6.2.3.3.2-1. | - | - | - | - |
| 4-9 | Steps 1 to 6 of generic test procedure in TS 36.508 subclause 6.4.2.7. And the UE move to idle mode on Cell 11. | - | - | - | - |
| 10 | Wait 30 seconds for UE logging interval timer to expire at least once | - | - | - | - |
| 11-18 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 11. | - | - | - | - |
| 19 | The SS send a <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 20 | Check: Does the UE send an <i>UEInformationResponse</i> message including at least one <i>logMeasReport</i> with serving cell measurements for Cell 11 ? | --> | <i>UEInformationResponse</i> | 1 | P |
| 21 | SS transmits a <i>RRCCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCCConnectionRelease</i> | - | - |
| 22 | The SS changes Cell 1, Cell 2 and Cell 11 level according to the row "T2" in Table 8.6.2.3.3.2-1. | - | - | - | - |
| 23-28 | Steps 1 to 6 of generic test procedure in TS 36.508 subclause 6.4.2.7. And the UE move to idle mode on Cell 2. | - | - | - | - |
| 29 | Wait 30 seconds for UE logging interval timer to expire at least once | - | - | - | - |
| 30 | The SS transmits a <i>Paging</i> message. | <-- | <i>Paging</i> | - | - |
| 31 | The UE transmits an <i>RRCCConnectionRequest</i> message. | --> | <i>RRCCConnectionRequest</i> | - | - |
| 32 | SS transmit an <i>RRCCConnectionSetup</i> message. | <-- | <i>RRCCConnectionSetup</i> | - | - |
| - | EXCEPTION: In case the UE had performed a logging before the cell re-selection to Cell 2 then the steps 33a1-33a7 are executed. | | | | |
| 33a1 | The UE transmit an <i>RRCCConnectionSetupComplete</i> message including <i>logMeasAvailable</i> IE set it to <i>true</i> . | --> | <i>RRCCConnectionSetupComplete</i> | - | - |
| 33a2 - 33a5 | Steps 6 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 2. | - | - | - | - |
| 33a6 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 33a7 | Check: Does the UE send an <i>UEInformationResponse</i> message with logged serving cell measurements of Cell 2 ? | --> | <i>UEInformationResponse</i> | 2 | F |
| - | EXCEPTION: In case the UE had not performed any logging before the cell re-selection to Cell 2 then the step 33b1 is executed. | - | - | - | - |
| 33b1 | Check: Does UE transmit an <i>RRCCConnectionSetupComplete</i> message with <i>logMeasAvailable</i> IE not present? | --> | <i>RRCCConnectionSetupComplete</i> | 2 | P |
| 34 | The SS transmits a | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |

| | | | | | |
|-----------|---|-----|------------------------------------|---|---|
| | <i>LoggedMeasurementConfiguration</i> message with a <i>trackingAreaCodeList</i> on Cell 2. | | <i>n</i> | | |
| 35 | The SS transmits a <i>RRCCConnectionRelease</i> message to release RRC connection and move to RRC_IDLE on Cell 2. | <-- | <i>RRCCConnectionRelease</i> | - | - |
| 36 | The SS changes Cell 1, Cell 2 and Cell 11 level according to the row "T3" in Table 8.6.2.3.3.2-1. | - | - | - | - |
| 37-42 | Steps 1 to 6 of generic test procedure in TS 36.508 subclause 6.4.2.7. And the UE move to idle mode on Cell 11. | - | - | - | - |
| 43 | The SS transmits a <i>Paging</i> message on Cell 11. | <-- | <i>Paging</i> | - | - |
| 44 | The UE transmits an <i>RRCCConnectionRequest</i> message on Cell 11. | --> | <i>RRCCConnectionRequest</i> | - | - |
| 45 | The SS transmit an <i>RRCCConnectionSetup</i> message on Cell 11. | <-- | <i>RRCCConnectionSetup</i> | - | - |
| - | EXCEPTION: In case the UE had performed a logging before the cell re-selection to Cell 11 then the steps 46a1-46a7 are executed. | | | | |
| 46a1 | The UE transmit an <i>RRCCConnectionSetupComplete</i> message including <i>logMeasAvailable</i> IE set it to <i>true</i> . | --> | <i>RRCCConnectionSetupComplete</i> | - | - |
| 46a2-46a5 | Steps 6 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 11. | - | - | - | - |
| 46a6 | The SS send a <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 46a7 | Check: Does the UE send an <i>UEInformationResponse</i> message with <i>logged serving cell measurements of Cell 11</i> ? | --> | <i>UEInformationResponse</i> | 4 | F |
| - | EXCEPTION: In case the UE had not performed any logging before the cell re-selection to Cell 11 then the step 46b1 is executed. | - | - | - | - |
| 46b1 | Check: Does UE transmit an <i>RRCCConnectionSetupComplete</i> message with <i>logMeasAvailable</i> IE not present? | --> | <i>RRCCConnectionSetupComplete</i> | 4 | P |
| 47 | The SS transmits an <i>RRCCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCCConnectionRelease</i> | - | - |
| 48 | The SS changes Cell 1, Cell 2 and Cell 11 level according to the row "T4" in Table 8.6.2.3.3.2-1. | - | - | - | - |
| 49-54 | Steps 1 to 6 of generic test procedure in TS 36.508 subclause 6.4.2.7. And the UE move to idle mode on Cell 1. | - | - | - | - |
| 55 | Wait 30 seconds for UE logging interval timer to expire at least once | - | - | - | - |
| 56-63 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 64 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 65 | Check: Does the UE send an <i>UEInformationResponse</i> include <i>logMeasReport</i> with logged serving cell measurements of Cell 1? | --> | <i>UEInformationResponse</i> | 3 | P |

8.6.2.3.3.3 Specific message contents

Table 8.6.2.3.3.3-1: SystemInformationBlockType3 for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-2 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType3 ::= SEQUENCE { | | | |
| intraFreqCellReselectionInfo SEQUENCE { | | | |
| t-ReselectionEUTRA | 7 | seconds | |
| } | | | |
| } | | | |

Table 8.6.2.3.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.2.3.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| areaConfiguration-r10 CHOICE { | | | |
| cellGlobalIdList-r10 SEQUENCE { | 1 entry | | |
| plmn-Identity[1] | plmn-Identity of Cell 11 | | |
| cellIdentity[1] | cellIdentity of Cell 11 | | |
| } | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3.3.3-3: UEInformationRequest (step 19, 33a6, 46a6 and 64, Table 8.6.2.3.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.2.3.3.3-4: UEInformationResponse (step 20 and 33a7, Table 8.6.2.3.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in LoggedMeasurementConfiguration in step 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3.3-5: RRCConnectionSetupComplete (step 33a1 and 46a1, Table 8.6.2.3.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| gummei-Type-r10 | Not checked | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | TRUE | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3.3-6: RRCConnectionSetupComplete (step 33b1 and 46b1, Table 8.6.2.3.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| gummei-Type-r10 | Not checked | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | Not present | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3.3.3-7: *LoggedMeasurementConfiguration* (step 34, Table 8.6.2.3.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A <i>LoggedMeasurementConfiguration</i> | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| areaConfiguration-r10 CHOICE { | | | |
| trackingAreaCodeList -r10 SEQUENCE { | 1 entry | | |
| trackingAreaCode [1] | TAI-1 | | |
| } | | | |
| } | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3.3.3-8: *UEInformationResponse* (step 46a7, Table 8.6.2.3.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |

| | | | |
|---|--|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 2 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3.3.3-9: UEInformationResponse (step 65, Table 8.6.2.3.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |

| | | | |
|---|---|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 34 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least one entry complies to entry with index 'x' below. SS records the <i>relativeTimeStamp</i> value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.3a Logged MDT / Logging and reporting / Limiting area scope / TAC list with PLMN identity

8.6.2.3a.1 Test Purpose (TP)

(1)

```

with { UE is in E-UTRA RRC_IDLE state and the RPLMN is included in plmn-IdentityList received in LoggedMeasurementConfiguration message with trackingAreaCodeList and plmn-Identity-perTAC-List on a LTE cell }
ensure that {
  when { UE camps on a LTE cell in the trackingAreaCodeList and plmn-Identity-perTAC-List }
  then { UE performs logged measurements }
}

```

8.6.2.3a.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.304, clause 8; TS 36.331, clauses 5.3.3.4, 5.6.5.3 and 5.6.8.2.

[TS 36.304, clause 8]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- The RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception, or is present in the *plmn-IdentityList* (see TS 36.331 [3]) if configured;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 36.331, clause 5.3.3.4]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include *logMeasAvailable*;

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:

3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;

3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;

3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;

3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;

3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;

- 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.8.2]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;

8.6.2.3a.3 Test description

8.6.2.3a.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.2.3a.3.1-1.

Table 8.6.2.3a.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.2.3a.3.3-5
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.2.3a.3.2 Test procedure sequence

Table 8.6.2.3a.3.2-1 illustrates the downlink power levels to be applied for the cell 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.2.3a.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|----|-----------------------|-----------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | "Off" | Only Cell 1 is available. (NOTE 1) |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | The power level values are assigned to satisfy $R_{Cell 1} < R_{Cell 12}$. |

NOTE 1: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1.

Table 8.6.2.3a.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|---|------------------|---------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | SS transmits a <i>LoggedMeasurementConfiguration</i> message including on Cell 1 to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message on Cell 1. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 12 levels according to the row "T1" in table 8.6.2.3a.3.2-1. | - | - | - | - |
| 4 | The generic test procedure in TS 36.508 subclause 6.4.2.7 is performed on Cell 12. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 5 | Wait [5s] to allow UE to activate logging. | - | - | - | - |
| 6-13 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 12. | - | - | - | - |
| 14 | The SS transmits a <i>UEInformationRequest</i> message on Cell 12. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with <i>LogMeasInfoList</i> on Cell 12? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.2.3a.3.3 Specific message contents

Table 8.6.2.3a.3.3-1: LoggedMeasurementConfiguration (step 1, Table 8.6.2.3a.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-4.0A | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| areaConfiguration-r10 CHOICE { | | | |
| trackingAreaCodeList-r10 SEQUENCE (SIZE (1..8)) OF { | 1 entry | | |
| TrackingAreaCode [1] | TAI-1 | | |
| } | | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension-r10 | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| plmn-IdentityList-r11 SEQUENCE (SIZE (1..16)) OF { | 1 entry | | |
| PLMN-Identity [1] | PLMN2 | | |
| } | | | |
| areaConfiguration-v1130 SEQUENCE { | | | |
| trackingAreaCodeList-v1130 SEQUENCE { | | | |
| plmn-Identity-perTAC-List-r11 SEQUENCE (SIZE (1..8)) OF { | 1 entry | | |
| PLMN-Identity [1] | PLMN2 | | |
| } | | | |
| } | | | |
| } | | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3a.3.3-2: RRCConnectionSetupComplete (steps 4 and 9, Table 8.6.2.3a.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not present or any allowed value | | |
| rif-InfoAvailable-r10 | Not present or any allowed value | | |
| logMeasAvailable-r10 | true | | |
| rn-SubframeConfigReq-r10 | Not present or any allowed value | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3a.3.3-3: UEInformationRequest (step 14, Table 8.6.2.3a.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A condition Logged MDT |
|---|
|---|

Table 8.6.2.3a.3.3-4: *UEInformationResponse* (step 15, Table 8.6.2.3a.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| traceReference-r10 SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-MNC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-MNC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE { | All entries comply to entry with index 'x' below. | | |
| locationInfo-r10 [x] | Not present or any allowed value | | |
| relativeTimeStamp-r10 [x] | Any allowed value | | |
| servCellIdentity-r10 [x] SEQUENCE { | | | |
| plmn-Identity [x] | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| cellIdentity [x] | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| } | | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 [x] | (0..97) | | |
| rsrqResult-r10 [x] | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 SEQUENCE { | | | |
| measResultListEUTRA-r10 SEQUENCE { | 1 entry | | |
| carrierFreq-r9 [1] | Same downlink EARFCN as used for Cell 1 | | |
| measResultList-r9 [1] SEQUENCE { | | | |
| physCellId [1] | PhysicalCellIdentity of Cell 1 | | |
| cgi-Info [1] | Not present | | |
| measResult [1] SEQUENCE { | | | |

| | | | |
|----------------------------|------------------------|--|--|
| rsrpResult [1] | Not present or (0..97) | | |
| rsrqResult [1] | Not present or (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListUTRA-r10 | Not present | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.3a.3.3-5: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.2.4 Logged MDT / logging and reporting / Indication of logged measurements at E-UTRA handover

8.6.2.4.1 Test Purpose (TP)

(1)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in
VarLogMeasReport }
ensure that {
  when { UE receives an RRCConnectionReconfiguration message including a mobilityControlInfo }
  then { UE transmits an RRCConnectionReconfigurationComplete message with logMeasAvailable is
true }
}
```

(2)

```
with { UE having indicated availability of logged measurements in RRCConnectionReconfiguration
message }
ensure that {
  when { UE has completed the E-UTRA handover procedure and receives a UEInformationRequest message
with logMeasReportReq present }
  then { UE transmits an UEInformationResponse message including logMeasReport }
}
```

8.6.2.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.3.5.4 and 5.6.5.3.

[TS 36.331, clause 5.3.5.4 (TP1)]

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

....

1> set the content of *RRCConnectionReconfigurationComplete* message as follows:

- 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include the *logMeasAvailable*;
 - 1> submit the *RRCCONNECTIONRECONFIGURATIONCOMPLETE* message to lower layers for transmission;
 - 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;
- NOTE 3: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.
- 2> the procedure ends;
- NOTE 4: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.2.4.3 Test description

8.6.2.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 4.
- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of intra-frequency neighbouring cell list in SIB4 set as defined in TS 36.508 [18] table 6.3.1.1-1.

UE:

None

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.2.4.3.2 Test procedure sequence

Table 8.6.2.4.3.2-1 shows the cell configurations used during the test. The configuration T0 indicates the initial conditions. Subsequent configurations marked "T1" are applied at the points indicated in the Main behaviour description in Table 8.6.2.4.3.2-2.

Table 8.6.2.4.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 4 | Remark |
|-----------|-----------|-----------|--------|--------|--|
| T0 | RS EPRE | dBm/15kHz | -85 | -91 | The power level values are such that measurement results for Cell 1 (M1) and Cell 4 (M4) satisfy exit condition for event A3 ($M4 < M1$). |
| T1 | RS EPRE | dBm/15kHz | -85 | -79 | The power level values are such that measurement results for Cell 1 (M1) and Cell 4 (M4) satisfy entry condition for event A3 ($M4 > M1$). |

Table 8.6.2.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 30 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 4-11 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 12 | The SS changes Cell 1 and Cell 4 parameters according to the row "T1" in table 8.6.2.4.3.2-1. | - | - | - | - |
| 13 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to order the UE to perform intra frequency handover to Cell 4. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 14 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message on Cell 4 with <i>logMeasAvailable</i> is true confirm the successful completion of the intra frequency handover? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 15 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 16 | Check: Does the UE send an <i>UEInformationResponse</i> message include <i>logMeasReport</i> . | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.2.4.3.3 Specific message contents

Table 8.6.2.4.3.3-1: *SystemInformationBlockType3* for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-2 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType3 ::= SEQUENCE { | | | |
| intraFreqCellReselectionInfo SEQUENCE { | | | |
| t-ReselectionEUTRA | 7 | seconds | |
| } | | | |
| } | | | |

Table 8.6.2.4.3.3-2: *LoggedMeasurementConfiguration* (step 1, Table 8.6.2.4.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A <i>LoggedMeasurementConfiguration</i> | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.4.3.3-3: RRCConnectionReconfigurationComplete (step 14, Table 8.6.2.4.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-9 RRCConnectionReconfigurationComplete | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | TRUE | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.4.3.3-4: UEInformationRequest (step 15, Table 8.6.2.4.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.2.4.3.3-5: UEInformationResponse (step 16, Table 8.6.2.4.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |

| | | | |
|---|--|--|--|
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.5 Logged MDT / Logging and reporting / Indication of logged measurements at E-UTRA re-establishment

8.6.2.5.1 Test Purpose (TP)

(1)

```

with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in
VarLogMeasReport }
ensure that {
  when { UE has initiated a re-establishment procedure and receives an RRCConectionReestablishment
message }
  then { UE transmits an RRCConectionReestablishmentComplete message with logMeasAvailable is
true }
}

```

(2)

```

with { UE indicated availability of logged measurements in RRCConectionReestablishmentComplete
message }
ensure that {
  when { UE has successfully completes the re-establishment procedure and resume the existing radio
bearer; and has receive a UEInformationRequest message with logMeasReportReq present }
  then { UE transmits an UEInformationResponse message including logMeasReport }
}

```

8.6.2.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.3.7.5 and 5.6.5.3.

[TS 36.331, clause 5.3.7.5 (TP1)]

The UE shall:

- 1> stop timer T301;
- ...
- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include the *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include the *logMeasAvailable*;
- 1> perform the measurement related actions as specified in 5.5.6.1;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

- ...
- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.2.5.3 Test description

8.6.2.5.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2.
- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of intra-frequency neighbouring cell list in SIB4 set as defined in TS 36.508 [18] table 6.3.1.1-1.

UE:

None

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18]

8.6.2.5.3.2 Test procedure sequence

Table 8.6.2.5.3.2-1 shows the cell configurations used during the test. The configuration T0 indicates the initial conditions. Subsequent configurations marked “T1” are applied at the points indicated in the Main behaviour description in Table 8.6.2.5.3.2-2.

Table 8.6.2.5.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 2 |
|-----------|-----------------------|-----------|--------|--------|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | -91 |
| T1 | Cell-specific RS EPRE | dBm/15kHz | Off | -85 |

Table 8.6.2.5.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 30 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 4-12 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 13 | The SS changes Cell 1 and Cell 2 parameters according to the row "T1" in table 8.6.2.5.3.2-1 in order that the radio link quality of Cell 1 is degraded and Cell 2 is suitable for camping. | - | - | - | - |
| 14 | The UE send <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 15 | The SS transmits <i>RRCConnectionReestablishment</i> message. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 16 | Check: Does the UE transmit <i>RRCConnectionReestablishmentComplete</i> message with <i>logMeasAvailable</i> set as <i>true</i> ? | --> | <i>RRCConnectionReestablishmentComplete</i> | 1 | P |
| 17 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume the existing radio bearer. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 18 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 19 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 20 | Check: Does the UE send an <i>UEInformationResponse</i> message include <i>logMeasReport</i> . | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.2.5.3.3 Specific message contents

Table 8.6.2.5.3.3-1: *SystemInformationBlockType3* for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-2 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>SystemInformationBlockType3</i> ::= SEQUENCE { | | | |
| <i>intraFreqCellReselectionInfo</i> SEQUENCE { | | | |
| <i>t-ReselectionEUTRA</i> | 7 | seconds | |
| } | | | |
| } | | | |

Table 8.6.2.5.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.2.5.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.5.3.3-3: RRCConnectionReestablishmentComplete (step 16, Table 8.6.2.5.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-11 RRCConnectionReestablishmentComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasAvailable-r10 | true | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.5.3.3-4: UEInformationRequest (step 19, Table 8.6.2.5.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.2.5.3.3-5: UEInformationResponse (step 20, Table 8.6.2.5.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in LoggedMeasurementConfiguration in step 1 | | |
| traceReference-r10 SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in LoggedMeasurementConfiguration in step 1 | | |

| | | | |
|---|--|--|--|
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.6 Logged MDT / Release of logged MDT measurement configuration / Expire of duration timer

8.6.2.6.1 Test Purpose (TP)

(1)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { The logging duration timer T330 expires }
  then { UE release VarLogMeasConfig and will not perform logged measurements }
}
```

(2)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { UE has released VarLogMeasConfig due to timer T330 has expired and UE receives UEInformationRequest message with logMeasReportReq present }
  then { UE transmits an UEInformationResponse message including logMeasReport }
}
```

(3)

```

with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in
VarLogMeasReport }
ensure that {
  when { UE has transmitted all the stored logMeasReport and UE receives UEInformationRequest
message with logMeasReportReq present }
then { UE transmits an UEInformationResponse message without logMeasReport}

```

8.6.2.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.6.5.3, 5.6.6.3 and 5.6.6.4.

[TS 36.331, clause 5.6.5.3 (TP2, TP3)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
 - 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.6.4 (TP1)]

Upon expiry of T330 the UE shall:

- 1> release *VarLogMeasConfig*;

The UE is allowed to discard stored logged measurements, i.e. to release *VarLogMeasReport* 48 hours after T330 expiry.

8.6.2.6.3 Test description

8.6.2.6.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None

Preamble:

- - The UE is in state Generic RB Established (state 3) on Cell 1 according to [18]

8.6.2.6.3.2 Test procedure sequence

Table 8.6.2.6.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|---------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 30 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 4-12 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 13 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 14 | The UE send an <i>UEInformationResponse</i> message include <i>logMeasReport-r10</i> . | --> | <i>UEInformationResponse</i> | - | - |
| - | EXCEPTION: In case the <i>logMeasAvailable-r10</i> in <i>logMeasReport-r10</i> is True, steps 14a1 and 14a2 will be executed. | - | - | - | - |
| 14a1 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 14a2 | The UE sends an <i>UEInformationResponse</i> message include <i>logMeasReport-r10</i> . | --> | <i>UEInformationResponse</i> | - | - |
| - | EXCEPTION: In case the <i>logMeasAvailable-r10</i> in <i>logMeasReport-r10</i> is True, steps 14a1 and 14a2 will be executed. | - | - | - | - |
| 15 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 16 | Check: Does the UE send an <i>UEInformationResponse</i> message not include <i>logMeasReport</i> ? | --> | <i>UEInformationResponse</i> | 3 | P |
| 17 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 18 | Wait 10 minutes for UE performing the logging at regular time intervals as to ensure timer T330 has expired. | - | - | - | - |
| 19-27 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 28 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 29 | Check: Does the UE send an <i>UEInformationResponse</i> message include <i>logMeasReport</i> ? | --> | <i>UEInformationResponse</i> | 2 | P |
| - | EXCEPTION: In case the <i>logMeasAvailable-r10</i> in <i>logMeasReport-r10</i> is True, steps 29a1 and 29a2 will be executed. | - | - | - | - |
| 29a1 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 29a2 | UE sends an <i>UEInformationResponse</i> message include <i>logMeasReport</i> . | --> | <i>UEInformationResponse</i> | - | - |
| - | EXCEPTION: In case the <i>logMeasAvailable-r10</i> in <i>logMeasReport-r10</i> is True, steps 29a1 and 29a2 will be executed. | - | - | - | - |
| 30 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 31 | Wait 30 seconds. | - | - | - | - |
| 32 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 33 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 34 | The SS transmit an <i>RRCConnectionSetup</i> message on Cell 1. | <-- | <i>RRCConnectionSetup</i> | - | - |
| 35 | Check: Does UE transmit an | --> | <i>RRCConnectionSetupComplete</i> | 1 | P |

| | | | | | |
|--|--|--|--|--|--|
| | <i>RRCConnectionSetupComplete</i> message with <i>logMeasAvailable</i> IE not present? | | | | |
|--|--|--|--|--|--|

8.6.2.6.3.3 Specific message contents

Table 8.6.2.6.3.3-1: *LoggedMeasurementConfiguration* (step 1, Table 8.6.2.6.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A <i>LoggedMeasurementConfiguration</i> | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>LoggedMeasurementConfiguration-r10</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| C1 CHOICE { | | | |
| <i>loggedMeasurementConfiguration-r10</i> | | | |
| SEQUENCE { | | | |
| <i>loggingDuration-r10</i> | min10 | 10 minutes | |
| <i>loggingInterval-r10</i> | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.6.3.3-2: *RRCConnectionSetupComplete* (step 8 and step 23, Table 8.6.2.6.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 <i>RRCConnectionSetupComplete</i> | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCConnectionSetupComplete</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>rrcConnectionSetupComplete-r8</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>gummei-Type-r10</i> | Not checked | | |
| <i>rlf-InfoAvailable-r10</i> | Not checked | | |
| <i>logMeasAvailable-r10</i> | TRUE | | |
| <i>m-SubframeConfigReq-r10</i> | Not checked | | |
| <i>nonCriticalExtension</i> SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.6.3.3-3: *UEInformationRequest* (step 13, step 14a1, step 15, step 28 and step 29a1, Table 8.6.2.6.3.2-1)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A <i>UEInformationRequest</i> , condition "Logged MDT" |
|---|

Table 8.6.2.6.3.3-4: UEInformationResponse (step 14, step 14a2, step 29 and step 29a2, Table 8.6.2.6.3.2-1)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | A least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not present | | |
| } | | | |
| logMeasAvailable-r10 | Not present or True | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.6.3.3-5: *UEInformationResponse* (step 16, Table 8.6.2.6.3.2-1)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReportReq-r10 SEQUENCE {} | Not present | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.6.3.3-6: *RRCConnectionSetupComplete* (step 35, Table 8.6.2.6.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 <i>RRCConnectionSetupComplete</i> | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCConnectionSetupComplete</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>rrcConnectionSetupComplete-r8</i> SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not checked | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | Not present | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.7 Logged MDT / Release of logged MDT measurement configuration / Reception of new logged measurement configuration, Detach or UE power off

8.6.2.7.1 Test Purpose (TP)

(1)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { UE receive a new LoggedMeasurementConfiguration message }
  then { UE discards the stored logMeasReport }
}
```

(2)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { UE receive a new LoggedMeasurementConfiguration message }
  then { UE discards the old logged measurement configuration }
}
```

```
}

```

(3)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in
VarLogMeasReport }
ensure that {
  when { UE is switched off or detaches from the EPS service }
  then { UE discards the stored logMeasReport }
}
```

(4)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in
VarLogMeasReport }
ensure that {
  when { UE is switched off or detaches from the EPS service }
  then { UE discards the logged measurement configuration }
}
```

8.6.2.7.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.6.5.3, and 5.6.7.2.

[TS 36.331, clause 5.6.5.3 (TP1, TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

- 1> if *rach-ReportReq* is set to *true*, set the contents of the *rach-Report* in the *UEInformationResponse* message as follows:
 - 2> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the last successfully completed random access procedure;
 - 2> if contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the last successfully completed random access procedure:
 - 3> set the *contentionDetected* to *true*;
 - 2> else:
 - 3> set the *contentionDetected* to *false*;
- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
- 1> if the *rlf-Report* is included in *UEInformationResponse*:
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.
- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;

- 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
- 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.7.2 (TP1, TP2, TP3, TP4)]

The UE shall initiate the procedure upon receiving a logged measurement configuration in another RAT. The UE shall also initiate the procedure upon power off or detach.

The UE shall:

- 1> stop timer T330, if running;
- 1> if stored, discard the logged measurement configuration as well as the logged measurement information, i.e. release the UE variables *VarLogMeasConfig* and *VarLogMeasReport*;

8.6.2.7.3 Test description

8.6.2.7.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None

Preamble:

- - The UE is in state Generic RB Established (state 3) on Cell 1 according to [18]

8.6.2.7.3.2 Test procedure sequence

Table 8.6.2.7.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|---------------------------------------|-----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 30 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 4-12 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 13 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 14 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 15 | Check: Does the UE send an <i>UEInformationResponse</i> message include <i>logMeasReport</i> ? | --> | <i>UEInformationResponse</i> | 1 | F |
| 16 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 17 | Wait 30 seconds for UE performing the logging at regular time intervals | | | | |
| 18-26 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 27 | The SS send an <i>UEInformationRequest</i> message to get <i>logMeasReport</i> . | <-- | <i>UEInformationRequest</i> | | |
| 28 | Check: Does the UE send an <i>UEInformationResponse</i> message include <i>logMeasReport</i> based on the <i>LoggedMeasurementConfiguration</i> as in step 1? | --> | <i>UEInformationResponse</i> | 2 | F |
| 29 | The SS transmits a <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 30 | The UE is switched off, or detaches from the network. | - | - | - | - |
| 31 | The UE is switched on, or attaches to the network. | - | - | - | - |
| 32-47 | The UE performs steps 2-17 of the registration procedure described in TS 36.508 table 4.5.2.3-1. | - | - | - | - |
| 48 | Wait 30 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 49 | The SS transmits a <i>Paging</i> message. | <-- | <i>Paging</i> | - | - |
| 50 | The UE transmits an <i>RRCConnectionRequest</i> message. | --> | <i>RRCConnectionRequest</i> | - | - |
| 51 | The SS transmit an <i>RRCConnectionSetup</i> message. | <-- | <i>RRCConnectionSetup</i> | - | - |
| 52 | Check: Does UE transmit an <i>RRCConnectionSetupComplete</i> message with <i>logMeasAvailable</i> IE not present? | --> | <i>RRCConnectionSetupComplete</i> | 3,4 | P |

8.6.2.7.3.3 Specific message contents

Table 8.6.2.7.3.3-1: LoggedMeasurementConfiguration (step 1, Table 8.6.2.7.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.7.3.3-2: RRCConnectionSetupComplete (step 8 and 22, Table 8.6.2.7.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not checked | | |
| r1f-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | true | | |
| m-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.7.3.3-3: LoggedMeasurementConfiguration (step 13, Table 8.6.2.7.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms5120 | 5.12 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.7.3.3-4: UEInformationRequest (step 14 and 27, Table 8.6.2.7.3.2-1)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.2.7.3.3-5: *UEInformationResponse* (step 15, Table 8.6.2.7.3.2-1)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>lateNonCriticalExtension</i> | Not checked | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>logMeasReport-r10</i> SEQUENCE {} | Not present | | |
| <i>nonCriticalExtension</i> SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.7.3.3-6: *UEInformationResponse* (step 28, Table 8.6.2.7.3.2-1)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>lateNonCriticalExtension</i> | Not checked | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>logMeasReport-r10</i> SEQUENCE { | | | |
| <i>absoluteTimeStamp-r10</i> | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 13 | | |
| <i>traceReference-r10</i> SEQUENCE { | | | |
| <i>plmn-identity-r10</i> SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 13 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 13 | | |

| | | | |
|---|--|--|--|
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 13 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 13 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 13 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not present | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.7.3.3-7: RRCConnectionSetupComplete (step 52, Table 8.6.2.7.3.2-1)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 <i>RRCConnectionSetupComplete</i> | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not checked | | |
| r1f-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | Not present | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.8 Logged MDT / Maintaining logged measurement configuration / UE state transitions and mobility

8.6.2.8.1 Test Purpose (TP)

(1)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { UE reselected to a cell belong to non MDT PLMN }
  then { UE does not indicate availability of Logged MDT measurements }
}
```

(2)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { UE reselects to a cell belong to non MDT PLMN }
  then { UE suspends Logged MDT measurements }
}
```

(3)

```
with { UE received LoggedMeasurementConfiguration message and has reselected to a cell belong to non MDT PLMN }
ensure that {
  when { UE returns to a cell belong to MDT PLMN }
  then { UE indicate availability of Logged MDT measurements }
}
```

(4)

```
with { UE received LoggedMeasurementConfiguration message and has reselected to a cell belong to non MDT PLMN }
ensure that {
  when { UE returns to a cell belong to MDT PLMN }
  then { UE resumes Logged MDT measurements }
}
```

(5)

```
with { UE received LoggedMeasurementConfiguration message and has stored logMeasReport in VarLogMeasReport }
ensure that {
  when { UE moves to RRC_CONNECTED state }
  then { UE maintains the Logged measurement configurations and logged measurement reports }
}
```

(6)

```
with { UE received LoggedMeasurementConfiguration message }
ensure that {
  when { UE moves to "any cell selection" or "camp on any cell" states }
  then { UE stop performing logged measurements and T330 keep running }
}
```

(7)

```
with { UE received LoggedMeasurementConfiguration message and had moved to "any cell selection" or "camp on any cell" states }
ensure that {
  when { UE returns to "camp normally" state }
  then { UE resumes logged MDT measurements }
}
```

8.6.2.8.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.6.5.3, 5.6.6.3 and 5.6.6.4.

[TS 36.304, clause 8 (TP1, TP2, TP5, TP6)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 1: 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 36.331, clause 5.3.3.4 (TP1, TP3)]

The UE shall:

- 1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10;
- 1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;
- 1> stop timer T300;
- 1> stop timer T302, if running;
- 1> stop timer T303, if running;
- 1> stop timer T305, if running;
- 1> stop timer T306, if running;
- 1> perform the actions as specified in 5.3.3.7;
- 1> stop timer T320, if running;
- 1> enter RRC_CONNECTED;
- 1> stop the cell re-selection procedure;
- 1> consider the current cell to be the PCell;
- 1> set the content of *RRCConnectionSetupComplete* message as follows:
 - 2> set the *selectedPLMN-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 2> if upper layers provide the 'Registered MME', include and set the *registeredMME* as follows:
 - 3> if the PLMN identity of the 'Registered MME' is different from the PLMN selected by the upper layers:

- 4> include the *plmnIdentity* in the *registeredMME* and set it to the value of the PLMN identity in the 'Registered MME' received from upper layers;
- 3> set the *mmegi* and the *mmec* to the value received from upper layers;
- 2> if upper layers provided the 'Registered MME':
 - 3> include and set the *gummei-Type* to the value provided by the upper layers;
- 2> if connecting as an RN:
 - 3> include the *rn-SubframeConfigReq*;
- 2> set the *dedicatedInfoNAS* to include the information received from upper layers;
- 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include *rlf-InfoAvailable*;
- 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include *logMeasAvailable*;
- 2> submit the *RRCCConnectionSetupComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.8.2 (TP4, TP5, TP7)]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
 - 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE 2: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

8.6.2.8.3 Test description

8.6.2.8.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell2, Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18]

8.6.2.8.3.2 Test procedure sequence

Table 8.6.2.8.3.2-1 shows the cell configurations used during the test. The configuration T0 indicates the initial conditions. Subsequent configurations marked “T1”, “T2”, “T3” and “T4” are applied at the points indicated in the Main behaviour description in Table 8.6.2.8.3.2-2.

Table 8.6.2.8.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 12 |
|-----------|-----------|-----------|--------|--------|---------|
| T0 | RS EPRE | dBm/15kHz | -85 | Off | Off |
| T1 | RS EPRE | dBm/15kHz | -91 | Off | -85 |
| T2 | RS EPRE | dBm/15kHz | Off | -85 | -91 |
| T3 | RS EPRE | dBm/15kHz | Off | Off | Off |
| T4 | RS EPRE | dBm/15kHz | -85 | Off | Off |

Table 8.6.2.8.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|--------------------------------|---------|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a LoggedMeasurementConfiguration message on Cell 1. | <-- | LoggedMeasurementConfiguration | - | - |
| 2 | The SS transmits a RRCConnectionRelease message to release the RRC connection. | <-- | RRCConnectionRelease | - | - |
| 3 | Wait 10 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 12 level according to the row "T1" in Table 8.6.2.8.3.2-1. | - | - | - | - |
| 5-10 | Steps 1 to 6 of generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 12. | - | - | - | - |
| 11 | Wait 10 seconds for UE to perform the logging at regular time intervals. | - | - | - | - |
| 12 | The SS transmits a Paging message. | <-- | Paging | - | - |
| 13 | The UE transmits an RRCConnectionRequest message. | --> | RRCConnectionRequest | - | - |
| 14 | The SS transmit an RRCConnectionSetup message. | <-- | RRCConnectionSetup | - | - |
| 15 | Check: Does UE transmit an RRCConnectionSetupComplete message with logMeasAvailable IE not present? | --> | RRCConnectionSetupComplete | 1 | P |
| 16 | The SS transmits a RRCConnectionRelease message to release RRC connection and move to RRC_IDLE on Cell 12. | <-- | RRCConnectionRelease | - | - |
| 17 | The SS changes Cell 1, Cell 2 and Cell 12 level according to the row "T2" in Table 8.6.2.8.3.2-1. | - | - | - | - |
| 18-23 | Steps 1 to 6 of generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 2. | - | - | - | - |
| 24 | Wait 10 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 25 | The SS transmits a Paging message. | <-- | Paging | - | - |
| 26 | The UE transmits an RRCConnectionRequest message. | --> | RRCConnectionRequest | - | - |
| 27 | The SS transmit an RRCConnectionSetup message. | <-- | RRCConnectionSetup | - | - |
| 28 | Check: Does UE transmit an RRCConnectionSetupComplete message with logMeasAvailable set as true? | --> | RRCConnectionSetupComplete | 3 | P |
| 29-32 | Steps 6 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 33 | The SS send a UEInformationRequest message to get logMeasReport. | <-- | UEInformationRequest | - | - |
| 34 | Check: Does the UE send an UEInformationResponse message including at least one logMeasReport with serving cell measurements for Cell 1 and Cell 2 and without serving cell measurements for Cell 12? | --> | UEInformationResponse | 2, 4, 5 | P |
| 35 | The SS transmits an RRCConnectionRelease message to release RRC connection and move to RRC_IDLE on Cell 2. | <-- | RRCConnectionRelease | - | - |
| 36 | Wait 10 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 37 | The SS changes Cell 2 and Cell 12 level according to the row "T3" in Table 8.6.2.8.3.2-1. | - | - | - | - |
| 38 | Wait 5 minutes. | - | - | - | - |
| 39 | The SS changes Cell 1 level according to the | - | - | - | - |

| | | | | | |
|-------|---|-----|------------------------------|-------|---|
| | row "T4" in Table 8.6.2.8.3.2-1. | | | | |
| 40 | Wait 10 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 41-48 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 49 | The SS send a <i>UEInformationRequest</i> message to get logMeasReport. | <-- | <i>UEInformationRequest</i> | | |
| 50 | Check: Does the UE send a <i>UEInformationResponse</i> message including <i>logMeasReport-r10</i> with serving cell measurements for Cell 1 and Cell 2? Note: The number of entries in <i>logMeasInfoList</i> should not be more than the expected logged measurement result entries within 30 seconds of logging periods. | --> | <i>UEInformationResponse</i> | 5,6,7 | P |

8.6.2.8.3.3 Specific message contents

Table 8.6.2.8.3.3-1: SystemInformationBlockType3 for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-2 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType3 ::= SEQUENCE { | | | |
| intraFreqCellReselectionInfo SEQUENCE { | | | |
| t-ReselectionEUTRA | 7 | seconds | |
| } | | | |
| } | | | |

Table 8.6.2.8.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.2.8.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A <i>LoggedMeasurementConfiguration</i> | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingDuration-r10 | min10 | 10 minutes | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.8.3.3-3: RRCConnectionSetupComplete (step 15, Table 8.6.2.8.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not checked | | |
| r1f-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | Not present | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.8.3.3-4: RRCConnectionSetupComplete (step 28, Table 8.6.2.8.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not checked | | |
| r1f-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | TRUE | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.8.3.3-5: UEInformationRequest (step 33 and 49, Table 8.6.2.8.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.2.8.3.3-6: UEInformationResponse (step 34, Table 8.6.2.8.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in LoggedMeasurementCon | | |

| | | | |
|---|--|--|--|
| | <i>figuration</i> in step 1 | | |
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementCon</i> figuration in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementCon</i> figuration in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementCon</i> figuration in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementCon</i> figuration in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementCon</i> figuration in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least 1 entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 2 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.8.3.3-7: *UEInformationResponse* (step 50, Table 8.6.2.8.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| <i>c1</i> CHOICE{ | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>lateNonCriticalExtension</i> | Not checked | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>logMeasReport-r10</i> SEQUENCE { | | | |
| <i>absoluteTimeStamp-r10</i> | Same value as sent by SS in <i>LoggedMeasurementCon- figuration</i> in step 1 | | |

| | | | |
|---|---|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least 1 entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry. | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 2 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10{} | Not checked | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.9 Logged MDT / Location information

8.6.2.9.1 Test Purpose (TP)

(1)

with { UE in E-UTRA RRC_CONNECTED state and UE has logged measurements with detailed location information available for E-UTRA and plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {

```

when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with a logMeasReport with locationCoordinates
in the locationInfo in the logged measurement entries }
}

```

8.6.2.9.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.306, clause 4.3.13.2; TS 36.331, clause 5.6.8.2.

[TS 36.306, clause 4.3.13.2 (TP1)]

standaloneGNSS-Location

This parameter defines whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements in RRC_IDLE.

[TS 36.331, clause 5.6.8.2 (TP1)]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
 - 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

8.6.2.9.3 Test description

8.6.2.9.3.1 Pre-test conditions

System Simulator:

- Two intra-frequency cells belonging to the same PLMN, but to different tracking areas: Cell 1, Cell 11
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed

- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of SIB4 set as defined in TS 36.508 [18] table 6.3.1.1-1.

Preamble:

- 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 36.509 [25] , if supported by the UE according to pc_UpdateUE_LocationInformation . Otherwise, or in addition any other suitable method may also be used.
- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.2.9.3.2 Test procedure sequence

Table 8.6.2.9.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" is applied at the point indicated in the Main behaviour description in Table 8.6.2.9.3.2-2.

Table 8.6.2.9.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 11 | Remark |
|----|-----------------------|---------------|--------|---------|---|
| T1 | Cell-specific RS EPRE | dBm/ 15kHz | -85 | -79 | The power level values are assigned to satisfy $R_{Cell\ 1} < R_{Cell\ 11}$. |

Table 8.6.2.9.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|--|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | SS transmits a <i>LoggedMeasurementConfiguration</i> message including to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 11 levels according to the row "T1" in table 8.6.2.9.3.2-1. (Note 1) | - | - | - | - |
| 5 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 11 to initiate a tracking area update procedure. (Note 1) | --> | <i>RRCConnectionRequest</i> | - | - |
| 6 | SS transmit an <i>RRCConnectionSetup</i> message. | <-- | RRC: <i>RRCConnectionSetup</i> | - | - |
| 7 | Check: Does the UE include the IE <i>logMeasAvailable</i> in the <i>RRCConnectionSetupComplete</i> message? | --> | RRC: <i>RRCConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST | 1 | P |
| 8-10 | Steps 4 to 6 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 11. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 11-19 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 11. | - | - | - | - |
| 20 | The SS transmits a <i>UEInformationRequest</i> message on Cell 11. | <-- | <i>UEInformationRequest</i> | - | - |
| 21 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with a <i>LogMeasInfoList</i> with at least two entries with serving cell idle mode measurements and where in at least one of the entries the IE <i>locationCoordinates-r10</i> is present. | --> | <i>UEInformationResponse</i> | 1 | P |
| Note 1: The change of power levels is to trigger a cell re-selection procedure to make sure that the UE is logging neighbouring cell measurements (logging interval=2.56 seconds) of Cell 11 while t-Reselection timer is running (7 seconds). | | | | | |

8.6.2.9.3.3 Specific message contents

Table 8.6.2.9.3.3-1: *SystemInformationBlockType3* for cell 1 (preamble)

| Derivation Path: 36.508 table 4.4.3.3-2 | | |
|--|--------------|---------|
| Information Element | Value/remark | Comment |
| SystemInformationBlockType3 ::= SEQUENCE { | | |
| intraFreqCellReselectionInfo SEQUENCE { | | |
| t-ReselectionEUTRA | 7 | seconds |
| } | | |
| } | | |

Table 8.6.2.9.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.2.9.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 | | | |
| SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.9.3.3-3: RRCConnectionSetupComplete (step 7, Table 8.6.2.9.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-18 RRCConnectionSetupComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| gummei-Type-r10 | Not checked | | |
| rif-Info Available-r10 | Not checked | | |
| logMeas Available-r10 | TRUE | | |
| rn-SubframeConfigReq-r10 | Not checked | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.9.3.4: UEInformationRequest (step 20, Table 8.6.2.9.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|
|---|

Table 8.6.2.9.3.3-5: *UEInformationResponse* (step 21, Table 8.6.2.9.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Not checked | | |
| traceReference-r10 SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| } | | | |
| traceRecordingSessionRef-r10 | Not checked | | |
| tce-Id-r10 | Not checked | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | At least 2 entries where at least one entry complies to entry with index 'x' below. SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[x] SEQUENCE { | | | |
| locationCoordinates-r10 CHOICE { | | | |
| ellipsoid-Point-r10 | Any allowed value | | |
| ellipsoidPointWithAltitude-r10 | Any allowed value | | |
| } | | | |
| relativeTimeStamp-r10 [x] | Not checked | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] | Not checked | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 11 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId [1] | Same as Cell 11 | | |
| cgi-Info [1] | Not checked | | |
| measResult [1] | Not checked | | |
| } | | | |
| } | | | |
| measResultListUTRA-r10 | Not present | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |

| | | | |
|---|--|--|--|
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.2.10 Logged MDT / Logging and reporting / Reporting at RRC connection establishment / PLMN list

8.6.2.10.1 Test Purpose (TP)

(1)

```
with { UE is in E-UTRA RRC_IDLE state, UE has logged measurements available and the RPLMN is
included in plmn-IdentityList received in LoggedMeasurementConfiguration message }
ensure that {
  when { UE performs an RRC Connection establishment procedure }
  then { UE sends an RRCConnectionSetupComplete message with logMeasAvailable }
}
```

(2)

```
with { UE is in E-UTRA RRC_CONNECTED state, UE has logged measurements available and the RPLMN is
included in plmn-IdentityList received in LoggedMeasurementConfiguration message }
ensure that {
  when { UE receives UEInformationRequest message with logMeasReportReq set to true }
  then { UE transmits UEInformationResponse messages with a logMeasReport }
}
```

8.6.2.10.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.304, clause 8; TS 36.331, clauses 5.3.3.4, 5.6.5.3 and 5.6.8.2.

[TS 36.304, clause 8]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- The RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception, or is present in the *plmn-IdentityList* (see TS 36.331 [3]) if configured;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 36.331, clause 5.3.3.4]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

- 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
- 3> include *logMeasAvailable*;

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
 - 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.8.2]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;

8.6.2.10.3 Test description

8.6.2.10.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.2.10.3.1-1.

Table 8.6.2.10.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.2.10.3.3-5
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.2.10.3.2 Test procedure sequence

Table 8.6.2.10.3.2-1 illustrates the downlink power levels to be applied for the cell 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.2.10.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|--|-----------------------|-----------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | "Off" | Only Cell 1 is available. (NOTE 1) |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | The power level values are assigned to satisfy $R_{Cell\ 1} < R_{Cell\ 12}$. |
| NOTE 1: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.2.10.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|---------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1 to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message on Cell 1. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 12 levels according to the row "T1" in table 8.6.2.10.3.2-1. | - | - | - | - |
| 4 | The generic test procedure in TS 36.508 subclause 6.4.2.7 is performed on Cell 12. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 5 | Wait [5s] to allow UE to activate logging. | - | - | - | - |
| 6 | The SS transmits a <i>Paging</i> message on Cell 12. | <-- | <i>Paging</i> | - | - |
| 7 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 12. | --> | <i>RRCConnectionRequest</i> | - | - |
| 8 | The SS transmits an <i>RRCConnectionSetup</i> message on Cell 12. | <-- | <i>RRCConnectionSetup</i> | - | - |
| 9 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message with <i>logMeasAvailable</i> on Cell 12? | --> | <i>RRCConnectionSetupComplete</i> | 1 | P |
| 10-13 | Steps 6 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 12. | - | - | - | - |
| 14 | The SS transmits a <i>UEInformationRequest</i> message on Cell 12. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with <i>LogMeasInfoList</i> on Cell 12? | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.2.10.3.3 Specific message contents

Table 8.6.2.10.3.3-1: LoggedMeasurementConfiguration (step 1, Table 8.6.2.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-4.0A | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms1280 | 1.28 seconds | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension-r10 | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| plmn-IdentityList-r11 SEQUENCE (SIZE (1..16)) OF SEQUENCE { | 1 entry | | |
| PLMN-Identity [1] | PLMN2 | | |
| } | | | |
| areaConfiguration-v1130 | Not present | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.10.3.3-2: RRCConnectionSetupComplete (steps 4 and 9, Table 8.6.2.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not present or any allowed value | | |
| rlf-InfoAvailable-r10 | Not present or any allowed value | | |
| logMeasAvailable-r10 | true | | |
| m-SubframeConfigReq-r10 | Not present or any allowed value | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.10.3.3-3: UEInformationRequest (step 14, Table 8.6.2.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A condition Logged MDT |
|---|
|---|

Table 8.6.2.10.3.3-4: *UEInformationResponse* (step 15, Table 8.6.2.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| traceReference-r10 SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-MNC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-MNC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE { | One or more entries where at least one entry complies to entry with index 'x' below. | | |
| locationInfo-r10 [x] | Not present or any allowed value | | |
| relativeTimeStamp-r10 [x] | Any allowed value | | |
| servCellIdentity-r10 [x] SEQUENCE { | | | |
| plmn-Identity [x] | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| cellIdentity [x] | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| } | | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 [x] | (0..97) | | |
| rsrqResult-r10 [x] | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 SEQUENCE { | | | |
| measResultListEUTRA-r10 SEQUENCE { | 1 entry | | |
| carrierFreq-r9 [1] | Same downlink EARFCN as used for Cell 1 | | |
| measResultList-r9 [1] SEQUENCE { | | | |
| physCellId [1] | PhysicalCellIdentity of Cell 1 | | |

- 1> set the content of *RRCCONNECTIONRECONFIGURATIONCOMPLETE* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFail-Report* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFail-Report*:
 - 3> include *connEstFailInfoAvailable*;
- 1> submit the *RRCCONNECTIONRECONFIGURATIONCOMPLETE* message to lower layers for transmission;
- 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;

NOTE 3: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.

- 2> the procedure ends;

NOTE 4: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEINFORMATIONREQUEST* message, the UE shall:

...

- 1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEINFORMATIONRESPONSE* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEINFORMATIONRESPONSE* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEINFORMATIONRESPONSE*:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
- 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.2.11.3 Test description

8.6.2.11.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 12.
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.2.11.3.1-1.

Table 8.6.2.11.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1, 2 | PLMN1 |
| 12 | PLMN2 |

UE:

None

Preamble:

- The UE is registered on PLMN2 (Cell 12) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN1 in the Equivalent PLMN list as described in Table 8.6.2.11.3.3-5
- The UE is in state Generic RB Established (state 3) on Cell 12 according to [18].

8.6.2.11.3.2 Test procedure sequence

Table 8.6.2.11.3.2-1 shows the cell configurations used during the test. The configuration T0 indicates the initial conditions. Subsequent configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.6.2.11.3.2-2.

Table 8.6.2.11.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 12 | Cell 1 | Cell 2 | Remark |
|-----------|-----------|-----------|---------|--------|--------|--------|
| T0 | RS EPRE | dBm/15kHz | -85 | -91 | "Off" | |
| T1 | RS EPRE | dBm/15kHz | -85 | -79 | "Off" | |
| T2 | RS EPRE | dBm/15kHz | -85 | -91 | -79 | |

Table 8.6.2.11.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 12. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 30 seconds for UE performing the logging at regular time intervals on Cell 12. | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 12 levels according to the row "T1" in table 8.6.2.11.3.2-1. | - | - | - | - |
| 5 | The generic test procedure in TS 36.508 subclause 6.4.2.7 is performed on Cell 1. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 6 | Wait 30 seconds for UE performing the logging at regular time intervals on Cell 1 | - | - | - | - |
| 7-14 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 15 | The SS changes Cell 1 and Cell 2 parameters according to the row "T2" in table 8.6.2.11.3.2-1. | - | - | - | - |
| 16 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to order the UE to perform intra frequency handover to Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 17 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2 with <i>logMeasAvailable</i> set true to confirm the successful completion of the intra frequency handover? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 18 | The SS sends a <i>UEInformationRequest</i> message with <i>logMeasReportReq</i> present. | <-- | <i>UEInformationRequest</i> | | |
| 19 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>logMeasReport</i> including logged measurements did on Cell 1 and Cell 12? | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.2.11.3.3 Specific message contents

Table 8.6.2.11.3.3-1: LoggedMeasurementConfiguration (step 1, Table 8.6.2.11.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-4.0A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| plmn-IdentityList-r11 SEQUENCE (SIZE (1..16)) OF { | 1 entry | | |
| PLMN-Identity [1] | PLMN1 | | |
| PLMN-Identity [2] | PLMN2 | | |
| } | | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.11.3.3-2: RRCConnectionReconfigurationComplete (step 17, Table 8.6.2.11.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-9 RRCConnectionReconfigurationComplete | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | true | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.11.3.3-3: UEInformationRequest (step 18, Table 8.6.2.11.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|
| |

Table 8.6.2.11.3.3-4: *UEInformationResponse* (step 19, Table 8.6.2.11.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| <i>c1</i> CHOICE{ | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>lateNonCriticalExtension</i> | Not checked | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>logMeasReport-r10</i> SEQUENCE { | | | |
| <i>absoluteTimeStamp-r10</i> | Same value as <i>absoluteTimeInfo</i> sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| <i>traceReference-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity-r10</i> SEQUENCE { | | | |
| <i>mcc</i> SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| <i>mnc</i> SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |

| | | | |
|---|--|--|--|
| } | | | |
| traceld-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-ld-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[1] | Not checked | | |
| relativeTimeStamp-r10 [1] | SS record the value | | |
| servCellIdentity-r10 [1] | Cell 12 | | |
| measResultServCell-r10 [1] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10[1] SEQUENCE { | Not checked | | |
| measResultListEUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF { | | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 1 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF { | | | |
| physCellId | Cell 1 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| locationInfo-r10[2] | Not checked | | |
| relativeTimeStamp-r10 [2] | SS record the value | | |
| servCellIdentity-r10 [2] | Cell 1 | | |
| measResultServCell-r10 [2] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10[2] SEQUENCE { | Not checked | | |
| measResultListEUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF { | | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 12 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF { | | | |
| physCellId | Cell 12 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |

| | | | |
|---------------------------------|-------------|--|--|
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.11.3.3-5: ATTACH ACCEPT for Cell 12 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN1 | | |

8.6.2.12 Logged MDT / Logging and reporting / Reporting at RRC connection re-establishment / PLMN list

8.6.2.12.1 Test Purpose (TP)

(1)

```
with { UE received LoggedMeasurementConfiguration message with plmn-IdentityList-r11 configured and
UE has logged measurements available with the RPLMN included in plmn-IdentityList stored in
VarLogMeasReport }
ensure that {
  when { UE has initiated a re-establishment procedure and receives an RRCConnectionReestablishment
message }
  then { UE transmits an RRCConnectionReestablishmentComplete message with logMeasAvailable is
true }
}
```

(2)

```
with { UE indicated the availability of logged measurements in RRCConnectionReestablishmentComplete
message }
ensure that {
  when { UE has successfully completed the re-establishment procedure and resume the existing radio
bearer; and has received a UEInformationRequest message with logMeasReportReq present }
  then { UE transmits a UEInformationResponse message including logMeasReport }
}
```

8.6.2.12.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clauses 5.3.7.5 and 5.6.5.3. Unless otherwise stated these are Rel-11 requirements.

[TS 36.331, clause 5.3.7.5 (TP1)]

The UE shall:

1> stop timer T301;

...

1> set the content of *RRCConnectionReestablishmentComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include the *rlf-InfoAvailable*;

2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable*;

- 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 3> include the *connEstFailInfoAvailable*;
- 1> perform the measurement related actions as specified in 5.5.6.1;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> submit the *RRCCONNECTIONREESTABLISHMENTCOMPLETE* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
 - 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.2.12.3 Test description

8.6.2.12.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 12.
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.2.12.3.1-1.

Table 8.6.2.12.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.2.12.3.3-6.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.2.12.3.2 Test procedure sequence

Table 8.6.2.12.3.2-1 shows the cell configurations used during the test. The configuration T0 indicates the initial conditions. Subsequent configurations marked "T1" are applied at the points indicated in the Main behaviour description in Table 8.6.2.12.3.2-2.

Table 8.6.2.12.3.2-1: Cell configuration changes over time

| | Parameter | Unit | Cell 1 | Cell 12 |
|-----------|-----------------------|-----------|--------|---------|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | -91 |
| T1 | Cell-specific RS EPRE | dBm/15kHz | Off | -85 |

Table 8.6.2.12.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message to release the RRC connection. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 30 seconds for UE performing the logging at regular time intervals | - | - | - | - |
| 4-12 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 13 | The SS changes Cell 1 and Cell 12 parameters according to the row "T1" in table 8.6.2.12.3.2-1 in order that the radio link quality of Cell 1 is degraded and Cell 12 is suitable for camping. | - | - | - | - |
| 14 | The UE sends <i>RRCConnectionReestablishmentRequest</i> message on Cell 12. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 15 | The SS transmits <i>RRCConnectionReestablishment</i> message. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 16 | Check: Does the UE transmit <i>RRCConnectionReestablishmentComplete</i> message with <i>logMeasAvailable</i> set to <i>true</i> ? | --> | <i>RRCConnectionReestablishmentComplete</i> | 1 | P |
| 17 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume the existing radio bearer. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 18 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 19 | The SS sends a <i>UEInformationRequest</i> message with <i>logMeasReportReq</i> present. | <-- | <i>UEInformationRequest</i> | - | - |
| 20 | Check: Does the UE send a <i>UEInformationResponse</i> message including <i>logMeasReport</i> ? | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.2.12.3.3 Specific message contents

Table 8.6.2.12.3.3-1: LoggedMeasurementConfiguration (step 1, Table 8.6.2.12.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-4.0A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| plmn-IdentityList-r11 SEQUENCE (SIZE (1..16)) OF { | | | |
| PLMN-Identity [1] | PLMN1 | | |
| PLMN-Identity [2] | PLMN2 | | |
| } | | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.12.3.3-2: RRCConnectionReestablishmentComplete (step 16, Table 8.6.2.12.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-11 RRCConnectionReestablishmentComplete | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rif-InfoAvailable-r9 | true | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasAvailable-r10 | true | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.12.3.3-3: RRCConnectionReconfiguration (step 17, Table 8.6.2.12.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.12.3.3-4: UEInformationRequest (step 19, Table 8.6.2.12.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A <i>UEInformationRequest</i> , condition "Logged MDT" |
|---|

Table 8.6.2.12.3.3-5: UEInformationResponse (step 20, Table 8.6.2.12.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as <i>absoluteTimeInfo</i> sent by SS in <i>LoggedMeasurementCon figuration</i> in step 1 | | |
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC- NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementCon figuration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC- NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementCon figuration</i> in step 1 | | |

| | | | |
|---|---|--|--|
| } | | | |
| traceld-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-ld-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | SS records the relativeTimeStamp value for each entry | | |
| locationInfo-r10[1] | Not checked | | |
| relativeTimeStamp-r10 [1] | SS record the value | | |
| servCellIdentity-r10 [1] | Cell 1 | | |
| measResultServCell-r10 [1] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10[1] SEQUENCE { | | | |
| measResultListEUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF { | | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 12 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF { | | | |
| physCellId | Cell 12 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.12.3.3-6: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.2.13 Logged MDT / Logging and reporting / PLMN list / PLMN change

8.6.2.13.1 Test Purpose (TP)

(1)

```
with { UE is in E-UTRA RRC_IDLE state, UE has logged measurements available and the RPLMN is not the
PLMN where the UE received LoggedMeasurementConfiguration message and is not included in plmn-
IdentityList received in LoggedMeasurementConfiguration message }
ensure that {
  when { UE performs an RRC Connection establishment procedure }
  then { UE sends an RRCConnectionSetupComplete message not including logMeasAvailable }
}
```

(2)

```
with { UE is in E-UTRA RRC_IDLE state, UE has logged measurements available and the RPLMN is not the
PLMN where the UE received LoggedMeasurementConfiguration message and is not included in plmn-
IdentityList received in LoggedMeasurementConfiguration message }
ensure that {
  when { UE selects the cell which belongs to the PLMN included in plmn-IdentityList and then
performs an RRC Connection establishment procedure }
  then { UE sends an RRCConnectionSetupComplete message with logMeasAvailable }
}
```

8.6.2.13.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.304, clause 8; TS 36.331, clauses 5.3.3.4, and 5.6.8.2.

[TS 36.304, clause 8]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- The RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception, or is present in the *plmn-IdentityList* (see TS 36.331 [3]) if configured;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 36.331, clause 5.3.3.4]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include *logMeasAvailable*;

[TS 36.331, clause 5.6.8.2]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;

8.6.2.13.3 Test description

8.6.2.13.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 12 and Cell 13
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.2.13.3.1-1.

Table 8.6.2.13.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |
| 13 | PLMN3 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.2.13.3.3-4
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.2.13.3.2 Test procedure sequence

Table 8.6.2.13.3.2-1 illustrates the downlink power levels to be applied for the cell 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.2.13.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 12 | Cell 13 | Remark |
|--|-----------------------|------------|--------|---------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15 kHz | -85 | "Off" | "Off" | Only Cell 1 is available. (NOTE 1) |
| T1 | Cell-specific RS EPRE | dBm/15 kHz | -85 | "Off" | -79 | The power level values are assigned to satisfy $R_{Cell\ 1} < R_{Cell\ 13}$. (NOTE 1) |
| T2 | Cell-specific RS EPRE | dBm/15 kHz | "Off" | -79 | -85 | The power level values are assigned to satisfy $R_{Cell\ 13} < R_{Cell\ 12}$. (NOTE 1) |
| NOTE 1: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.2.13.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|---------------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | SS transmits a <i>LoggedMeasurementConfiguration</i> message on Cell 1 to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message on Cell 1. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging. | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 13 levels according to the row "T1" in table 8.6.2.13.3.2-1. | - | - | - | - |
| 5 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 13. | --> | <i>RRCConnectionRequest</i> | - | - |
| 6 | The SS transmit an <i>RRCConnectionSetup</i> message on Cell 13. | <-- | <i>RRCConnectionSetup</i> | - | - |
| 7 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message with no <i>logMeasAvailable</i> on Cell 13? | --> | <i>RRCConnectionSetupComplete</i> | 1 | P |
| 8-10 | Steps 4 to 6 of the generic radio bearer establishment procedure in TS 36.508 subclause 6.4.2.7 are executed to successfully complete the service request procedure. | - | - | - | - |
| 11 | The SS changes Cell 1, Cell 12 and Cell 13 levels according to the row "T2" in table 8.6.2.13.3.2-1. | - | - | - | - |
| 12 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 12. | --> | <i>RRCConnectionRequest</i> | - | - |
| 13 | The SS transmit an <i>RRCConnectionSetup</i> message on Cell 12. | <-- | <i>RRCConnectionSetup</i> | - | - |
| 14 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message with <i>logMeasAvailable</i> on Cell 12? | --> | <i>RRCConnectionSetupComplete</i> | 2 | P |
| 15-17 | Steps 4 to 6 of the generic radio bearer establishment procedure in TS 36.508 subclause 6.4.2.7 are executed to successfully complete the service request procedure. | - | - | - | - |

8.6.2.13.3.3 Specific message contents

Table 8.6.2.13.3.3-1: LoggedMeasurementConfiguration (step 1, Table 8.6.2.13.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-4.0A | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms1280 | 1.28 seconds | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension-r10 | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| plmn-IdentityList-r11 SEQUENCE (SIZE (1..16)) OF SEQUENCE { | 1 entry | | |
| PLMN-Identity [1] | PLMN2 | | |
| } | | | |
| areaConfiguration-v1130 | Not present | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.13.3.3-2: RRCConnectionSetupComplete (step 7, Table 8.6.2.13.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not present or any allowed value | | |
| rlf-InfoAvailable-r10 | Not present or any allowed value | | |
| logMeasAvailable-r10 | Not present | | |
| m-SubframeConfigReq-r10 | Not present or any allowed value | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.13.3.3-3: RRCConnectionSetupComplete (step 14, Table 8.6.2.13.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | Not present or any allowed value | | |
| rif-InfoAvailable-r10 | Not present or any allowed value | | |
| logMeasAvailable-r10 | true | | |
| rn-SubframeConfigReq-r10 | Not present or any allowed value | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.2.13.3.3-4: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.3 Inter-RAT Logged MDT

8.6.3.1 Logged MDT / UTRAN Inter-RAT measurement, logging and reporting

8.6.3.1.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state camping normally on an E-UTRA cell where logged measurement is
configured without areaConfiguration and the UE is able to detect a UTRA cell }
ensure that {
  when { T330 is running }
  then { UE is logging serving cell idle mode measurements and UTRA neighbouring cell measurements }
}
```

(2)

```
with { UE in UTRA RRC_CONNECTED state and UE has logged UTRA neighbouring cell measurements
available from earlier measurements performed while in E-UTRA and plmn-Identity stored in
VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { handover from UTRA to E-UTRA cell successfully and T330 is running }
  then { UE includes the logMeasAvailable IE in the RRCConnectionReconfigurationComplete message }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has logged UTRA neighbouring cell measurements
available for E-UTRA and plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with a logMeasReport with UTRA neighbouring
cell measurements }
}
```


8.6.3.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.304, clause 8; TS 36.331, clauses 5.4.2.3, 5.6.5.3, 5.6.6.3, 5.6.8.2, 6.2.2.

[TS 36.304, clause 8 (TP1,TP2)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 1: 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 36.331, clause 5.4.2.3 (TP2)]

The UE shall:

...

1> set the content of *RRCConnectionReconfigurationComplete* message as follows:

...

2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:

3> include *logMeasAvailable*;

1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;

...

2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

NOTE 2: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

[TS 36.331, clause 5.6.5.3 (TP3)]

Upon receiving the *UEInformationRequest* message, the UE shall

...

1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:

2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:

3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;

3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;

- 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
- 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
- 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
- 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.6.3 (TP1)]

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;
- 1> store the RPLMN as *plmn-Identity* in *VarLogMeasReport*;
- 1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;
- 1> start timer T330 with the timer value set to the *loggingDuration*;

[TS 36.331, clause 5.6.8.2 (TP1)]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
 - 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;

- 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE 3: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS 36.331, clause 6.2.2 (TP1)]

- LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

Table 8.6.3.1.2-1: LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
    criticalExtensions          CHOICE {
        c1                      CHOICE {
            loggedMeasurementConfiguration-r10    LoggedMeasurementConfiguration-r10-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture          SEQUENCE {}
    }
}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
    traceReference-r10          TraceReference-r10,
    traceRecordingSessionRef-r10    OCTET STRING (SIZE (2)),
    tce-Id-r10                  OCTET STRING (SIZE (1)),
    absoluteTimeInfo-r10        AbsoluteTimeInfo-r10,
    areaConfiguration-r10        AreaConfiguration-r10          OPTIONAL, -- Need OR
    loggingDuration-r10          LoggingDuration-r10,
    loggingInterval-r10          LoggingInterval-r10,
    nonCriticalExtension          SEQUENCE {}                  OPTIONAL -- Need OP
}
-- ASN1STOP
```

LoggedMeasurementConfiguration field descriptions

| | |
|--|---|
| <i>absoluteTimeInfo</i> | Indicates the absolute time in the current cell. |
| <i>tce-Id</i> | Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| <i>traceRecordingSessionRef</i> | Parameter Trace Recording Session Reference: See TS 32.422 [58] |

8.6.3.1.3 Test description

8.6.3.1.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 5 - Cell 1 is E-UTRAN cell, Cell 5 is a UTRA cell.
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRAN cells with content of UTRA carrier frequency list in SIB6 set as defined in TS 36.508 [18] table 6.3.1.3-1.

Preamble:

- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.3.1.3.2 Test procedure sequence

Table 8.6.3.1.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" and "T2" are applied at the point indicated in the Main behaviour description in Table 8.6.3.1.3.2-2.

Table 8.6.3.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Remark |
|----|-----------------------|--------------|--------|--------|--|
| T1 | Cell-specific RS EPRE | dBm/15 kHz | -97 | - | |
| | CPICH_Ec | dBm/3.84 MHz | - | -60 | $S_{\text{nonServingCell, Cell1}} > \text{Thresh}_{\text{Cell1,high}}$ |
| T2 | Cell-specific RS EPRE | dBm/15 kHz | -80 | - | The power level values are such that entering conditions for event 3a are satisfied. |
| | CPICH_Ec | dBm/3.84 MHz | - | -100 | |

Table 8.6.3.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message including to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 5 levels according to the row "T1" in table 8.6.3.1.3.2-1. (Note 1) | - | - | - | - |
| 5 | The UE transmits an RRC CONNECTION REQUEST message on Cell 5 to initiate a routing area update procedure. (Note 1) | --> | RRC CONNECTION REQUEST | - | - |
| 6 | The SS transmit an RRC CONNECTION SETUP message. | <-- | RRC CONNECTION SETUP | - | - |
| 7 | The UE transmit an RRC CONNECTION SETUP COMPLETE message. | --> | RRC CONNECTION SETUP COMPLETE | - | - |
| 8-14 | Steps 4 to 10 of the generic test procedure in TS 36.508 subclause 6.4.2.8 are performed on Cell 5. NOTE: The UE performs a RAU procedure and the RRC connection is released. | - | - | - | - |
| 15-19 | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA PS RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs Network initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | For UTRAN FDD, EXCEPTION: Steps 20a1 to 20a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. For UTRAN TDD, goto step 21. | - | - | - | - |
| 20a1 | IF <i>pc_UTRA_CompressedModeRequired</i> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 20a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 21 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 22 | The SS changes Cell 1 and Cell 5 level according to the row "T2" in table 8.6.3.1.3.2-1. | - | - | - | - |
| 23 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 24 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 25 | Check: Does the UE include the IE <i>logMeasAvailable</i> in the <i>RRCConnectionReconfigurationComplete</i> message on Cell 1? | --> | <i>RRCConnectionReconfigurationComplete</i> | 2 | P |
| 26 | The SS transmits a <i>UEInformationRequest</i> message on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |

| | | | | | |
|--|---|-----|------------------------------|------|---|
| 27 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with a <i>LogMeasInfoList</i> with at least one inter-RAT neighbouring cell measurement of Cell 1. | --> | <i>UEInformationResponse</i> | 1, 3 | P |
| Note 1: The change of power levels is to trigger an inter-RAT cell re-selection procedure to make sure that the UE is logging inter-RAT neighbouring cell measurements (logging interval=2.56 seconds) of Cell 5 while t-ReselectionUTRA timer is running (7 seconds). | | | | | |

8.6.3.1.3.3 Specific message contents

Table 8.6.3.1.3.3-1: SystemInformationBlockType6 for Cell 1 (preamble, 8.6.3.1.3.2-2)

| Derivation Path: 36.508 table 4.4.3.3-5 | | | |
|--|---------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType6 ::= SEQUENCE { | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE { | | | UTRA-FDD |
| carrierFreq[n] | Downlink UARFCN of Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| threshX-High[n] | 5 (10dB) | | |
| threshX-Low[n] | 5 (10dB) | | |
| t-ReselectionUTRA | 7 | | |
| } | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE { | | | UTRA-TDD |
| carrierFreq[n] | Downlink UARFCN of Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| threshX-High[n] | 5 (10dB) | | |
| threshX-Low[n] | 5 (10dB) | | |
| t-ReselectionUTRA | 7 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.3.1.3.3-2: System Information Block type 19 for Cell 5 (preamble, Table 8.6.3.1.3.2-2)

| Derivation Path: 36.508 table 4.4.4.1-1 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SysInfoType19 ::= SEQUENCE { | | | |
| utra-PriorityInfoList ::= SEQUENCE { | | | |
| utra-ServingCell ::= SEQUENCE { | | | |
| priority | 5 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.1.3.3-3: LoggedMeasurementConfiguration (step 1, Table 8.6.3.1.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.1.3.3-4: RRCConnectionReconfigurationComplete (step 25, Table 8.6.3.1.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-9 RRCConnectionReconfigurationComplete | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | TRUE | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.1.3.3-5: UEInformationRequest (step 26, Table 8.6.3.1.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.3.1.3.3-6: UEInformationResponse (step 27, Table 8.6.3.1.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in LoggedMeasurementConfiguration in step 1 | | |

| | | | |
|---|---|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRA-r10 | Not present | | |
| measResultListUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 5 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId [1] | Same as Cell 5 | | |
| cgi-Info [1] | Not checked | | |
| measResult [1] SEQUENCE { | | | |
| utra-RSCP | (-5..91) | | |
| utra-EcN0 | (0..49) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.3.2 Logged MDT / GERAN Inter-RAT measurement, logging and reporting

8.6.3.2.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state camping normally on an E-UTRA cell where logged measurement is
configured without areaConfiguration and the UE is able to detect a GERAN cell }
ensure that {
  when { T330 is running }
  then { UE is logging serving cell idle mode measurements and GERAN neighbouring cell measurements
  }
}
```

(2)

```
with { UE in GPRS Registered state with active packet data transfer in NC2 mode and UE has logged
GERAN neighbouring cell measurements available from earlier measurements performed while in E-UTRA
and plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { UE handover from GERAN to E-UTRA cell successfully and T330 is running }
  then { UE includes the logMeasAvailable IE in the RRCConnectionReconfigurationComplete message }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has logged GERAN neighbouring cell measurements
available for E-UTRA and plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with a logMeasReport with GERAN neighbouring
cell measurements }
}
```

8.6.3.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.304, clause 8; TS 36.331, clauses 5.4.2.3, 5.6.5.3, 5.6.6.3, 5.6.8.2, 6.2.2.

[TS 36.304, clause 8 (TP1)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 1: 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 36.331, clause 5.4.2.3 (TP2)]

The UE shall:

...

1> set the content of *RRCConnectionReconfigurationComplete* message as follows:

...

- 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include *logMeasAvailable*;
- 2> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;

...

- 2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

NOTE 2: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

[TS 36.331, clause 5.6.5.3 (TP3)]

Upon receiving the *UEInformationRequest* message, the UE shall

...

- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
 - 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.6.3 (TP1)]

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;
- 1> store the RPLMN as *plmn-Identity* in *VarLogMeasReport*;

1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;

1> start timer T330 with the timer value set to the *loggingDuration*;

[TS 36.331, clause 5.6.8.2 (TP1)]

While T330 is running, the UE shall:

1> perform the logging in accordance with the following:

2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:

3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;

2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:

3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;

3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:

4> include the *locationCoordinates*;

3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;

3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;

3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE 3: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS 36.331, clause 6.2.2 (TP1)]

- LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
    criticalExtensions      CHOICE {
        c1                  CHOICE {
            loggedMeasurementConfiguration-r10
            LoggedMeasurementConfiguration-r10-IEs,
```

```

        spare3 NULL, spare2 NULL, spare1 NULL
    },
    criticalExtensionsFuture          SEQUENCE {}
}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
    traceReference-r10                TraceReference-r10,
    traceRecordingSessionRef-r10     OCTET STRING (SIZE (2)),
    tce-Id-r10                        OCTET STRING (SIZE (1)),
    absoluteTimeInfo-r10             AbsoluteTimeInfo-r10,
    areaConfiguration-r10            AreaConfiguration-r10          OPTIONAL, -- Need OR
    loggingDuration-r10              LoggingDuration-r10,
    loggingInterval-r10              LoggingInterval-r10,
    nonCriticalExtension              SEQUENCE {}                  OPTIONAL -- Need OP
}

-- ASN1STOP

```

| LoggedMeasurementConfiguration field descriptions | |
|--|---|
| absoluteTimeInfo | Indicates the absolute time in the current cell. |
| tce-Id | Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| traceRecordingSessionRef | Parameter Trace Recording Session Reference: See TS 32.422 [58] |

8.6.3.2.3 Test description

8.6.3.2.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 24 - Cell 1 is E-UTRAN cell, Cell 24 is a GERAN cell.
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of GERAN carrier frequency group list in SIB7 set as defined in TS 36.508 [18] table 6.3.1.4-1.

Preamble:

- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.3.2.3.2 Test procedure sequence

Table 8.6.3.2.3.2-1 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 8.6.3.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 24 | Remark |
|-----------|-----------------------|------------|--------|---------|--------|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | |
| | RSSI | dBm | - | [-85] | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -100 | - | |
| | RSSI | dBm | - | [-60] | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | |
| | RSSI | dBm | - | [-85] | |

Table 8.6.3.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|---|--|------------------|---|-----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message including to configure the UE to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 24 levels according to the row "T1" in table 8.6.3.2.3.2-1. (Note 1) | - | - | - | - |
| 5 | Generic test procedure in TS 36.508 Table 6.4.2.9 is performed and the UE will camp on GERAN Cell 24. | | | | |
| 6 | UE is brought into downlink packet transfer mode according to TS 51.010 clause 40.4.3.14 | | | | |
| 7 | The SS changes Cell 1 and Cell 24 levels according to the row "T2" in table 8.6.3.2.3.2-1. | - | - | - | - |
| 8 | The SS transmits PS HANDOVER COMMAND on Cell24 | <-- | PS HANDOVER COMMAND | - | - |
| 9 | Check: Does the UE include the IE <i>logMeasAvailable</i> in the <i>RRCConnectionReconfigurationComplete</i> message on Cell 1? | --> | <i>RRCConnectionReconfigurationComplete</i> | 2 | P |
| 10 | The SS transmits a <i>UEInformationRequest</i> message on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 11 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with a <i>LogMeasInfoList</i> with at least one inter-RAT neighbouring cell measurement of Cell 24. | --> | <i>UEInformationResponse</i> | 1,3 | P |
| Note 1: The change of power levels is to trigger an inter-RAT cell re-selection procedure to make sure that the UE is logging GERAN neighbouring cell measurements (logging interval=2.56 seconds) of Cell 5 while t-ReselectionGERAN timer is running (7 seconds). | | | | | |

8.6.3.2.3.3 Specific message contents

Table 8.6.3.2.3.3-1: SystemInformationBlockType7 for cell 1 (preamble and all steps, Table 8.6.3.2.3.2-2)

| Derivation Path: 36.508 table 4.4.3.3-6 | | | |
|---|--------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType7 ::= SEQUENCE { | | | |
| t-ReselectionGERAN | 7 | | |
| carrierFreqsInfoListcarrierFreqsInfoListSEQUENCE (SIZE (1..maxGNFNG)) OF SEQUENCE { | | | |
| carrierFreqs carrierFreqs[n] SEQUENCE { | | | |
| startingARFCN[n] | Same starting ARFCN used for cell 24 | | |
| bandIndicator[n] | same band used for GERAN cell24 | | |
| followingARFCNs[n] CHOICE { | | | |
| explicitListOfARFCNs[n] | Same ARFCN used for cell24 | | |
| } | | | |
| } | | | |
| commonInfo[n] SEQUENCE { | | | |
| cellReselectionPriority[n] | 3 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.2.3.3-2: LoggedMeasurementConfiguration (step 1, Table 8.6.3.2.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A LoggedMeasurementConfiguration | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 | | | |
| SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.2.3.3-3: RRCConnectionReconfigurationComplete (step 9, Table 8.6.3.2.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-9 RRCConnectionReconfigurationComplete | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | TRUE | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.2.3.3-4: UEInformationRequest (step 10, Table 8.6.3.2.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.3.2.3.3-5: UEInformationResponse (step 11, Table 8.6.3.2.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |

| | | | |
|---|---|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRAN-r10 | Not present | | |
| measResultListUTRAN-r10 | Not present | | |
| measResultListGERAN-r10 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 24 | | |
| physCellId [1] | Same as Cell 24 | | |
| cgi-Info [1] | Not checked | | |
| measResult [1] SEQUENCE { | | | |
| rsi | (0..63) | | |
| } | | | |
| } | | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.3.3 Logged MDT / CDMA2000 Inter-RAT measurement, logging and reporting

8.6.3.3.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state camping normally on an E-UTRA cell where logged measurement is
configured without areaConfiguration and the UE is able to detect a CDMA2000 cell }
ensure that {
  when { T330 is running }
  then { UE is logging serving cell idle mode measurements and CDMA2000 neighbouring cell
measurements }
}
```

(2)

```
with { UE in E-UTRA RRC_CONNECTED state and UE has logged CDMA2000 neighbouring cell measurements
available for E-UTRA and plmn-Identity stored in VarLogMeasReport is equal to the RPLMN }
ensure that {
  when { receiving UEInformationRequest message }
  then { UE transmits UEInformationResponse messages with a logMeasReport with Inter-RAT
neighbouring cell measurements }
}
```

8.6.3.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.304, clause 8; TS 36.331, clauses 5.6.6.3, 5.6.8.2, 5.6.5.3 and 6.2.2.

[TS 36.304, clause 8 (TP1)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 1: 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 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall

...

- 1> if the *logMeasReportReq* is present and the *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;

- 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
- 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
- 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 5.6.6.3 (TP1)]

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;
- 1> store the RPLMN as *plmn-Identity* in *VarLogMeasReport*;
- 1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;
- 1> start timer T330 with the timer value set to the *loggingDuration*;

[TS 36.331, clause 5.6.8.2 (TP1)]

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and the RPLMN of the UE is the same as the *plmn-Identity* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
 - 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT;

NOTE 3: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS 36.331, clause 6.2.2 (TP1)]

- LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

Table 8.6.3.3.2-1: LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
    criticalExtensions          CHOICE {
        c1                     CHOICE {
            loggedMeasurementConfiguration-r10 LoggedMeasurementConfiguration-r10-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture SEQUENCE {}
    }
}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
    traceReference-r10          TraceReference-r10,
    traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
    tce-Id-r10                  OCTET STRING (SIZE (1)),
    absoluteTimeInfo-r10       AbsoluteTimeInfo-r10,
    areaConfiguration-r10      AreaConfiguration-r10          OPTIONAL, -- Need OR
    loggingDuration-r10        LoggingDuration-r10,
    loggingInterval-r10        LoggingInterval-r10,
    nonCriticalExtension        SEQUENCE {}                  OPTIONAL -- Need OP
}
-- ASN1STOP
```

| LoggedMeasurementConfiguration field descriptions | |
|--|---|
| <i>absoluteTimeInfo</i> | Indicates the absolute time in the current cell. |
| <i>tce-Id</i> | Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| <i>traceRecordingSessionRef</i> | Parameter Trace Recording Session Reference: See TS 32.422 [58] |

And the procedure ends.

8.6.3.3.3 Test description

8.6.3.3.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 15
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of CDMA2000 HRPD carrier frequency list in SIB8 set as defined in TS 36.508 [18] table 6.3.1.5-1.

Preamble:

- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.3.3.3.2 Test procedure sequence

Table 8.6.3.3.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" is applied at the point indicated in the Main behaviour description in Table 8.6.3.3.3.2-2.

Table 8.6.3.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 15 | Remark |
|--|-----------------------|-------------|--------|---------|---|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | The power level values are such that entering conditions for event B2 are not satisfied: Inequality B2-1 (Entering condition 1) $Ms + Hys > Thresh1$ Inequality B2-2 (Entering condition 2) $Mn + Ofn - Hys < Thresh2$ |
| | lor/loc | dB | - | -20 | |
| | loc | dBm/1.23MHz | - | -55 | |
| | Pilot_Ec/lo (Note 1) | dB | - | -20 | |
| | lor/loc | dB | - | -5 | |
| | loc | dBm/1.23MHz | - | -55 | |
| | Pilot_Ec/lo (Note 1) | dB | - | -6 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS | | | | | |

Table 8.6.3.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------------------------------------|-----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message including to configure the UE how to perform logging of measurement results while in RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 15 levels according to the row "T1" in table 8.6.3.3.3.2-1. | - | - | - | - |
| 5 | The SS transmits a RRC CONNECTION SETUP message. | <-- | RRC CONNECTION SETUP | - | - |
| 6 | The UE include the IE "Logged Meas Available" in the RRC CONNECTION SETUP COMPLETE message. | --> | RRC CONNECTION SETUP COMPLETE | - | - |
| 7 | The SS transmits a <i>UEInformationRequest</i> message on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 8 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with a <i>LogMeasInfoList</i> with at least one inter-RAT neighbouring cell measurement of Cell 1. | --> | <i>UEInformationResponse</i> | 1,2 | P |

8.6.3.3.3.3 Specific message contents

Table 8.6.3.3.3-3: *LoggedMeasurementConfiguration* (step 1, Table 8.6.3.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-4.0A <i>LoggedMeasurementConfiguration</i> | | | |
|---|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| C1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 | | | |
| SEQUENCE { | | | |
| loggingInterval-r10 | ms2560 | 2.56 seconds | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.3.3-4: *UEInformationRequest* (step 7, Table 8.6.3.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A <i>UEInformationRequest</i> , condition "Logged MDT" |
|---|

Table 8.6.3.3.3-5: *UEInformationResponse* (step 8, Table 8.6.3.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B <i>UEInformationResponse</i> | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |

| | | | |
|---|---|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRA-r10 | Not present | | |
| measResultListUTRA-r10 | Not present | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry if available | | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 if available | | |
| cgi-Info[1] CHOICE { | | | |
| cellGlobalIdHRPD | cellGlobalId of Cell 15 if available | | |
| } | | | |
| measResult[1] SEQUENCE { | | | |
| pilotStrength | (0..63) if available | | |
| } | | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value | | |

| | | | |
|----------------------|------------------|--|--|
| | calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |
| } | | | |

8.6.3.4 Logged MDT / Logging and reporting / Reporting at UTRAN Inter-RAT handover / PLMN list

8.6.3.4.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state camping normally on an E-UTRA cell where logged measurement is
configured with the RPLMN included in plmn-IdentityList and the UE is able to detect a UTRA cell }
ensure that {
  when { T330 is running }
  then { UE is logging serving cell idle mode measurements and UTRA neighbouring cell measurements
}
}
```

(2)

```
with { UE in UTRA RRC_CONNECTED state and UE has logged E-UTRA measurements and UTRA neighbouring
cell measurements available from earlier measurements performed while in E-UTRA }
ensure that {
  when { UE handovers from UTRA to E-UTRA cell successfully and T330 is running and the current
RPLMN is included in plmn-IdentityList stored in VarLogMeasReport }
  then { UE sends the RRCConnectionReconfigurationComplete message with logMeasAvailable IE set to
true }
}
```

(3)

```
with { UE in E-UTRA RRC_CONNECTED state and has logged measurements available for E-UTRA and the
RPLMN is included in plmn-IdentityList stored in VarLogMeasReport }
ensure that {
  when { UE receives UEInformationRequest message with logMeasReportReq present }
  then { UE transmits UEInformationResponse messages with logMeasReport included }
}
```

8.6.3.4.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 34.304, clause 8; TS 36.331, clauses 5.4.2.3, 5.6.5.3, 5.6.6.3, 5.6.8.2, 6.2.2. Unless otherwise stated these are Rel-11 requirements.

[TS 36.304, clause 8 (TP1, TP2)]

The UE may be configured to perform logging of measurement results in RRC_IDLE mode with the *LoggedMeasurementsConfiguration* message as specified in TS 36.331 [3]. 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 RRC_IDLE mode;
- RPLMN of the UE is the same as the RPLMN at the point of time of *LoggedMeasurementConfiguration* message reception, or is present in the *plmn-IdentityList* (see TS 36.331 [3]) if configured;
- The UE is camped on a cell belonging to the *areaConfiguration* (see TS 36.331 [3]), 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 1: 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 36.331, clause 5.4.2.3 (TP2)]

The UE shall:

...

1> set the content of *RRCCONNECTIONRECONFIGURATIONCOMPLETE* message as follows:

...

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable*;

2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable*;

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable*;

1> submit the *RRCCONNECTIONRECONFIGURATIONCOMPLETE* message to lower layers for transmission using the new configuration;

...

2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

NOTE 2: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

[TS 36.331, clause 5.6.6.3 (TP1)]

Upon receiving the *LOGGEDMEASUREMENTCONFIGURATION* message the UE shall:

1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;

1> store the received *loggingDuration*, *loggingInterval* and *areaConfiguration*, if included, in *VarLogMeasConfig*;

1> if the *LOGGEDMEASUREMENTCONFIGURATION* message includes *plmn-IdentityList*:

2> set *plmn-IdentityList* in *VarLogMeasReport* to include the RPLMN as well as the PLMNs included in *plmn-IdentityList*;

1> else:

2> set *plmn-IdentityList* in *VarLogMeasReport* to include the RPLMN;

1> store the received *absoluteTimeInfo*, *traceReference*, *traceRecordingSessionRef* and *tce-Id* in *VarLogMeasReport*;

1> start timer T330 with the timer value set to the *loggingDuration*;

[TS 36.331, clause 5.6.8.2 (TP1)]

While T330 is running, the UE shall:

1> perform the logging in accordance with the following:

- 2> if the UE is camping normally on an E-UTRA cell and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 3> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
- 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
 - 3> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging interval 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

[TS 36.331, clause 5.6.5.3 (TP3)]

Upon receiving the *UEInformationRequest* message, the UE shall

...

- 1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;

2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

[TS 36.331, clause 6.2.2 (TP1)]

- LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
    criticalExtensions          CHOICE {
        c1                     CHOICE {
            loggedMeasurementConfiguration-r10 LoggedMeasurementConfiguration-r10-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture SEQUENCE {}
    }
}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
    traceReference-r10          TraceReference-r10,
    traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
    tce-Id-r10                  OCTET STRING (SIZE (1)),
    absoluteTimeInfo-r10       AbsoluteTimeInfo-r10,
    areaConfiguration-r10      AreaConfiguration-r10          OPTIONAL,    -- Need OR
    loggingDuration-r10        LoggingDuration-r10,
    loggingInterval-r10        LoggingInterval-r10,
    nonCriticalExtension        LoggedMeasurementConfiguration-v1080-IEs  OPTIONAL    -- Need
OP
}

LoggedMeasurementConfiguration-v1080-IEs ::= SEQUENCE {
    lateNonCriticalExtension-r10 OCTET STRING          OPTIONAL,    -- Need OP
    nonCriticalExtension         LoggedMeasurementConfiguration-v1130-IEs  OPTIONAL    -- Need
OP
}

LoggedMeasurementConfiguration-v1130-IEs ::= SEQUENCE {
    plmn-IdentityList-r11       PLMN-IdentityList3-r11  OPTIONAL,    -- Need OR
    areaConfiguration-v1130     AreaConfiguration-v1130  OPTIONAL,    -- Need OR
    nonCriticalExtension         SEQUENCE {}             OPTIONAL    -- Need OP
}
-- ASN1STOP
```

| LoggedMeasurementConfiguration field descriptions | |
|--|--|
| absoluteTimeInfo | Indicates the absolute time in the current cell. |
| areaConfiguration | Used to restrict the area in which the UE performs measurement logging to cells broadcasting either one of the included cell identities or one of the included tracking area codes/ identities . |
| plmn-IdentityList | Indicates a set of PLMNs defining when the UE performs measurement logging as well as the associated status indication and information retrieval i.e. the UE performs these actions when the RPLMN is part of this set of PLMNs. |
| tce-Id | Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| traceRecordingSessionRef | Parameter Trace Recording Session Reference: See TS 32.422 [58] |

8.6.3.4.3 Test description

8.6.3.4.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 5 and Cell 12 - Cell 1 and Cell 12 are E-UTRA N cell, Cell 5 is a UTRA cell.
- Cell power levels are selected according to [18] so that camping on Cell 1 is guaranteed
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of UTRA carrier frequency list in SIB6 set as defined in TS 36.508 [18] table 6.3.1.3-1.
- The PLMNs are identified in the test by the identifiers in Table 8.6.3.4.3.1-1.

Table 8.6.3.4.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.3.4.3.3-7
- The UE is in state Generic RB Established (state 3) according to [18] on Cell 1.

8.6.3.4.3.2 Test procedure sequence

Table 8.6.3.4.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. The configuration marked "T1" and "T2" are applied at the point indicated in the Main behaviour description in Table 8.6.3.4.3.2-2.

Table 8.6.3.4.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 12 | Cell 5 | Remark |
|--|--------------------------|--------------|--------|---------|--------|--|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | "Off" | - | S _{nonServingCell, Cell5} > Thresh Cell5 _{high} |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | - | -65 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | - | -67 | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | -85 | -70 | - | The power level values are such that entering conditions for event 3a are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | - | -100 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | - | -100 | |
| NOTE 1: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.3.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>LoggedMeasurementConfiguration</i> message to configure the UE to perform logging of measurement results while in E-UTRA RRC_IDLE. | <-- | <i>LoggedMeasurementConfiguration</i> | - | - |
| 2 | The SS transmits an <i>RRCConnectionRelease</i> message. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 3 | Wait 5s to allow UE to activate logging | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 5 levels according to the row "T1" in table 8.6.3.4.3.2-1. (Note 1) | - | - | - | - |
| 5 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 6-10 | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRAPS RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs Network initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | For UTRAN FDD, EXCEPTION: Steps 11a1 to 11a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. For UTRAN TDD, goto step 12. | - | - | - | - |
| 11a1 | IF <i>pc_UTRA_CompressedModeRequired</i> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 11a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 12 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 13 | The SS changes Cell 12 and Cell 5 levels according to the row "T2" in table 8.6.3.4.3.2-1. | - | - | - | - |
| 14 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 15 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 16 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message with the IE <i>logMeasAvailable</i> set to true on Cell 12? | --> | <i>RRCConnectionReconfigurationComplete</i> | 2 | P |
| 17 | The UE transmits a TRACKING AREA UPDATE REQUEST message on Cell 12. | - | - | - | - |
| 18 | SS responds with a TRACKING AREA UPDATE ACCEPT message. NOTE: The TAU is accepted with PLMN1 listed as an Equivalent PLMN | - | - | - | - |
| 19 | The UE transmits a TRACKING AREA UPDATE COMPLETE message. | - | - | - | - |
| 20 | The SS transmits a <i>UEInformationRequest</i> message on Cell 12 with <i>logMeasReportReq</i> present. | <-- | <i>UEInformationRequest</i> | - | - |

| | | | | | |
|--|--|-----|------------------------------|------|---|
| 21 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with <i>logMeasReport</i> included? | --> | <i>UEInformationResponse</i> | 1, 3 | P |
| Note 1: The change of power levels is to trigger an inter-RAT cell re-selection procedure to make sure that the UE is logging inter-RAT neighbouring cell measurements (logging interval=2.56 seconds) of Cell 5 while t-ReselectionUTRA timer is running (7 seconds). | | | | | |

8.6.3.4.3.3 Specific message contents

Table 8.6.3.4.3.3-1: System InformationBlockType6 for Cell 1 (preamble, 8.6.3.4.3.2-2)

| Derivation Path: 36.508 table 4.4.3.3-5 | | | |
|--|---------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType6 ::= SEQUENCE { | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE { | | | UTRA-FDD |
| carrierFreq[n] | Downlink UARFCN of Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| t-ReselectionUTRA | 7 | | |
| } | | | |
| carrierFreqListUTRA-TDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE { | | | UTRA-TDD |
| carrierFreq[n] | Downlink UARFCN of Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| t-ReselectionUTRA | 7 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.3.4.3.3-2: System Information Block type 19 for Cell 5 (preamble, Table 8.6.3.4.3.2-2)

| Derivation Path: 36.508 table 4.4.4.1-1 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SysInfoType19 ::= SEQUENCE { | | | |
| utra-PriorityInfoList ::= SEQUENCE { | | | |
| utra-ServingCell ::= SEQUENCE { | | | |
| priority | 5 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.4.3.3-3: LoggedMeasurementConfiguration (step 1, Table 8.6.3.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-4.0A | | | |
|--|--------------|--------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| LoggedMeasurementConfiguration-r10 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| loggedMeasurementConfiguration-r10 SEQUENCE { | | | |
| loggingInterval-r10 | | | |
| nonCriticalExtension SEQUENCE { | ms2560 | 2.56 seconds | |
| lateNonCriticalExtension | Not present | | |
| nonCriticalExtension SEQUENCE { | | | |
| plmn-IdentityList-r11 SEQUENCE (SIZE (1..16)) OF { | | | |
| PLMN-Identity [1] | PLMN1 | | |
| PLMN-Identity [2] | PLMN2 | | |
| } | | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.4.3.3-4: RRCConnectionReconfigurationComplete (step 16, Table 8.6.3.4.3.2-2)

| Derivation path: 36.508 clause 4.6.1 table 4.6.1-9 RRCConnectionReconfigurationComplete | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| rlf-InfoAvailable-r10 | Not checked | | |
| logMeasAvailable-r10 | true | | |
| nonCriticalExtension SEQUENCE {} | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.4.3.3-5: UEInformationRequest (step 20, Table 8.6.3.4.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23A UEInformationRequest, condition "Logged MDT" |
|---|

Table 8.6.3.4.3.3-6: UEInformationResponse (step 21, Table 8.6.3.4.3.2-2)

| Derivation Path: 36.508 clause 4.6.1 table 4.6.1-23B UEInformationResponse | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not checked | | |
| nonCriticalExtension SEQUENCE { | | | |
| logMeasReport-r10 SEQUENCE { | | | |
| absoluteTimeStamp-r10 | Same value as sent by SS in <i>LoggedMeasurementCon- figuration</i> in step 1 | | |

| | | | |
|---|--|--|--|
| traceReference-r10SEQUENCE { | | | |
| plmn-Identity-r10 SEQUENCE { | | | |
| mcc SEQUENCE (SIZE (3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| mnc SEQUENCE (SIZE (2..3)) OF MCC-NMC-Digit | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceId-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| } | | | |
| traceRecordingSessionRef-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| tce-Id-r10 | Same value as sent by SS in <i>LoggedMeasurementConfiguration</i> in step 1 | | |
| logMeasInfoList-r10 SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF SEQUENCE { | | | |
| locationInfo-r10[x] | Not checked | | |
| relativeTimeStamp-r10 [x] | SS record the value | | |
| servCellIdentity-r10 [x] | Same as Cell 1 | | |
| measResultServCell-r10 [x] SEQUENCE { | | | |
| rsrpResult-r10 | (0..97) | | |
| rsrqResult-r10 | (0..34) | | |
| } | | | |
| measResultNeighCells-r10 [x] SEQUENCE { | | | |
| measResultListEUTRA-r10 | Not present | | |
| measResultListUTRA-r10 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 5 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId [1] | Same as Cell 5 | | |
| cgi-Info [1] | Not checked | | |
| measResult [1] SEQUENCE { | | | |
| utra-RSCP | (-5..91) | | |
| utra-EcN0 | (0..49) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListGERAN-r10 | Not present | | |
| measResultListCDMA2000-r10 | Not present | | |
| } | | | |
| } | | | |
| logMeasAvailable-r10 | Not present | | |
| } | | | |
| nonCriticalExtension SEQUENCE { | Not checked | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.3.4.3.3-7: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

Table 8.6.3.4.3.3-8: TRACKING AREA UPDATE ACCEPT for Cell 12 (step 18, Table 8.6.3.4.3.2-2)

| Derivation path: 36.508 Table 4.7.2-24 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN1 | | Cell 28 |

8.6.4 Logged Radio Link Failure

8.6.4.1 Radio Link Failure logging / Reporting of Intra-frequency measurements

8.6.4.1.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the intra-frequency measurement and reported that the UE
has radio link failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for intra-
frequency neighbour cell }
}

```

8.6.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.7.4, 5.3.7.5, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:

- 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include the *rlf-InfoAvailable*;

...

- 1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached;

- 2> consider radio link failure to be detected;
- 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the radio link failure is detected.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.1.3 Test description

8.6.4.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.1.3.2 Test procedure sequence

Table 8.6.4. 1.3.2-1 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" and "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -91 | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy exit condition for event A3 (M2 < M1). |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -79 | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy entry condition for event A3 (M2 > M1). |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | -79 | Only Cell 2 is available. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.4.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message to setup intra frequency measurement on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 2 parameters according to the row "T1" in Table 8.6.4.1.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.4.1.3.2-1. | - | - | - | - |
| 6 | The UE transmits an <i>RRConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRConnectionReestablishmentRequest</i> | - | - |
| 7 | The SS transmits an <i>RRConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRConnectionReestablishment</i> | - | - |
| 8 | The UE transmits an <i>RRConnectionReestablishmentComplete</i> message on Cell 2. | --> | <i>RRConnectionReestablishmentComplete</i> | - | - |
| 9 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 10 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 11 | The SS transmits a <i>UEInformationRequest</i> message on Cell 2. | <-- | <i>UEInformationRequest</i> | - | - |
| 12 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 2? | --> | <i>UEInformationResponse</i> | 1 | P |
| 13 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |

8.6.4.1.3.3 Specific message contents

Table 8.6.4.1.3.3-1: *RRConnectionReconfiguration* (step 1, Table 8.6.4.1.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.4.1.3.3-2: *MeasConfig* (Table 8.6.4.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.4.1.3.3-3: *MeasurementReport* (step 4, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.1.3.3-4: RRCConnectionReestablishmentRequest (step 6, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| } SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.1.3.3-5: RRCConnectionReestablishmentComplete (step 8, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| } SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| r11-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.1.3.3-6: RRCConnectionReconfiguration (step 9, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.1.3.3-7: UEInformationRequest (step 11, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.1.3.3-8: *UEInformationResponse* (step 12, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | Physical cell Identity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|---------------------------|---|--|--|
| | <i>type1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| timeConnFailure-r10 | Not present | | |
| connectionFailureType-r10 | rlf | | |
| previousPCellId-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.4.2 Radio Link Failure logging / Reporting of Inter-frequency measurements

8.6.4.2.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the inter-frequency measurement and reported that the UE
has radio link failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for inter-
frequency neighbour cell }
}

```

8.6.4.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.7.4, 5.3.7.5, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:

- 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include the *rlf-InfoAvailable*;

...

- 1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or

- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the radio link failure is detected.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.2.3 Test description

8.6.4.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 3
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.2.3.2 Test procedure sequence

Table 8.6.4.2.3.2-1 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" and "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -97 | The power level values are such that measurement results for Cell 1 (M1) and Cell 3 (M3) satisfy exit condition for event A3 ($M3 < M1$). |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -73 | The power level values are such that measurement results for Cell 1 (M1) and Cell 3 (M3) satisfy entry condition for event A3 ($M3 > M1$). |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | -73 | Only Cell 3 is available. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.4.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message to setup inter-frequency measurement on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 3 parameters according to the row "T1" in Table 8.6.4.2.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.4.2.3.2-1. | - | - | - | - |
| 6 | The UE transmits an <i>RRConnectionReestablishmentRequest</i> message on Cell 3. | --> | <i>RRConnectionReestablishmentRequest</i> | - | - |
| 7 | The SS transmits an <i>RRConnectionReestablishment</i> message on Cell 3. | <-- | <i>RRConnectionReestablishment</i> | - | - |
| 8 | The UE transmits an <i>RRConnectionReestablishmentComplete</i> message on Cell 3. | --> | <i>RRConnectionReestablishmentComplete</i> | - | - |
| 9 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 3. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 10 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 3. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 11 | The SS transmits a <i>UEInformationRequest</i> message on Cell 3. | <-- | <i>UEInformationRequest</i> | - | - |
| 12 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 3? | --> | <i>UEInformationResponse</i> | 1 | P |
| 13 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 3? | - | - | 1 | - |

8.6.4.2.3.3 Specific message contents

Table 8.6.4.2.3.3-1: *RRConnectionReconfiguration* (step 1, Table 8.6.4.2.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.4.2.3.3-2: *MeasConfig* (Table 8.6.4.2.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f2) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f2 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.4.2.3.3-3: *MeasurementReport* (step 4, Table 8.6.4.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 3 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.2.3.3-4: RRCConnectionReestablishmentRequest (step 6, Table 8.6.4.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.2.3.3-5: RRCConnectionReestablishmentComplete (step 8, Table 8.6.4.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.2.3.3-6: RRCConnectionReconfiguration (step 9, Table 8.6.4.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.2.3.3-7: UEInformationRequest (step 11, Table 8.6.4.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.2.3.3-8: *UEInformationResponse* (step 12, Table 8.6.4.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 3 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 3 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|----------------------------------|---|--|--|
| | <i>type1</i> broadcasted in Cell 3 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 3 | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Not present | | |
| <i>connectionFailureType-r10</i> | <i>rlf</i> | | |
| <i>previousPCellId-r10</i> | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.4.3 Radio Link Failure logging / Reporting at RRC connection establishment and reestablishment

8.6.4.3.1 Test Purpose (TP)

(1)

```
with { UE in RRC_CONNECTED state detecting radio link failure }
ensure that {
  when { T301 expires after UE having sent an RRCConnectionReestablishmentRequest message, the UE has radio link failure information available in VarRLF-Report and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
  then { UE sends the RRCConnectionSetupComplete message with rlf-InfoAvailable included when UE performs TAU procedure }
}
```

(2)

```
with { UE in RRC_CONNECTED state detecting radio link failure }
ensure that {
  when { UE has radio link failure information available in VarRLF-Report and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
  then { UE sends the RRCConnectionReestablishmentComplete message with rlf-InfoAvailable included }
}
```

(3)

```
with { UE in RRC_CONNECTED state with the radio link failure information available and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
ensure that {
  when { UE receives the UEInformationRequest message with rlf-ReportReq set to true }
  then { UE sends the UEInformationResponse message with rlf-Report included }
}
```

(4)

```
with { UE in RRC_CONNECTED state with the radio link failure information available and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message with eestablishmentCellId set to the global cell identity of the selected cell }
}
```

(5)

```
with { UE in RRC_CONNECTED state with successful delivery of the UEInformationResponse message confirmed by lower layer }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message without rlf-Report included }
}
```

8.6.4.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4, 5.3.7.5, 5.3.11.3, 5.3.7.4 and 5.6.5.3.

[TS 36.331, clause 5.3.3.4 (TP1)]

The UE shall:

...

1> set the content of *RRCCONNECTIONSETUPCOMPLETE* message as follows:

...

2> set the *dedicatedInfoNAS* to include the information received from upper layers;

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include *rlf-InfoAvailable*;

...

2> submit the *RRCCONNECTIONSETUPCOMPLETE* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.7.5 (TP2)]

The UE shall:

...

1> set the content of *RRCCONNECTIONREESTABLISHMENTCOMPLETE* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include the *rlf-InfoAvailable*;

...

1> submit the *RRCCONNECTIONREESTABLISHMENTCOMPLETE* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.11.3 (TP1, TP2)]

The UE shall:

1> upon T310 expiry; or

1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or

1> upon indication from RLC that the maximum number of retransmissions has been reached:

2> consider radio link failure to be detected;

2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-Identity* to the RPLMN;

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the radio link failure is detected.

[TS 36.331, clause 5.3.7.4 (TP4)]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.6.5.3 (TP4,TP5)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.3.3 Test description

8.6.4.3.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 3 and Cell 6
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.3.3.2 Test procedure sequence

Table 8.6.4.3.3.2-1 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" and "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Cell 6 | Remark |
|--|-----------------------|------------|--------|--------|--------|--------|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | "Off" | "Off" | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | -85 | "Off" | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | "Off" | -85 | |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.4.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|------|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 and Cell 3 parameters according to the row "T1" in Table 8.6.4.3.3.2-1 in order that the radio link quality of Cell 1 is degraded and Cell 3 is suitable for camping. | - | - | - | - |
| 2 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 3. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 3 | The SS does not respond to any <i>RRCConnectionReestablishmentRequest</i> message and waits for 1s to ensure that T301 expires and the UE goes to RRC_IDLE state on Cell 3. | | | | |
| 4 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 3 | --> | RRC: <i>RRCConnectionRequest</i> | - | - |
| 5 | The SS transmit an <i>RRCConnectionSetup</i> message. | <-- | RRC: <i>RRCConnectionSetup</i> | - | - |
| 6 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message to confirm the successful completion of the connection establishment with <i>rfl-InfoAvailable</i> included? | --> | RRC: <i>RRCConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST | 1 | P |
| 7 | The SS responds with TRACKING AREA UPDATE ACCEPT message. | <-- | RRC: <i>DLInformationTransfer</i> NAS: TRACKING AREA UPDATE ACCEPT | - | - |
| 8 | The UE sends a TRACKING AREA UPDATE COMPLETE on Cell 3 to finish the TAU procedure | --> | RRC: <i>ULInformationTransfer</i> NAS: TRACKING AREA UPDATE COMPLETE | - | - |
| 9 | The SS changes Cell 3 and Cell 6 parameters according to the row "T2" in Table 8.6.4.3.3.2-1 in order that the radio link quality of Cell 3 is degraded and Cell 6 is suitable for camping. | - | - | - | - |
| 10 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 6. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 11 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 6. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 12 | Check: Does the UE transmit an <i>RRCConnectionReestablishmentComplete</i> message on Cell 6 with <i>rfl-InfoAvailable</i> included? | --> | <i>RRCConnectionReestablishmentComplete</i> | 2 | P |
| 13 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume existing radio bearer on Cell 6. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 14 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 6. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 15 | The SS transmits a <i>UEInformationRequest</i> message with <i>rfl-ReportReq</i> set to <i>true</i> on Cell 6. | <-- | <i>UEInformationRequest</i> | - | - |
| 16 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 6 with <i>rfl-Report</i> included? Check: Does the <i>reestablishmentCellId</i> included in the <i>UEInformationResponse</i> message equal to the global cell identity of Cell 6? | --> | <i>UEInformationResponse</i> | 3, 4 | P |
| 17 | The SS transmits a <i>UEInformationRequest</i> message with <i>rfl-ReportReq</i> set to <i>true</i> on Cell 6. | <-- | <i>UEInformationRequest</i> | - | - |
| 18 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 6 without <i>rfl-Report</i> included? | --> | <i>UEInformationResponse</i> | 5 | P |
| 19 | Check: Does the test result of generic test | - | - | 1 | - |

| | | | | | |
|--|---|--|--|--|--|
| | procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 6? | | | | |
|--|---|--|--|--|--|

8.6.4.3.3.3 Specific message contents

Table 8.6.4.3.3.3-1: RRCConnectionReestablishmentRequest (step 2, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3.3-2: RRCConnectionSetupComplete (step 6, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-UL | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r10 | true | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3-3: RRCConnectionReestablishmentRequest (step 10, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 3 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3-4: RRCConnectionReestablishmentComplete (step 12, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3-5: RRCConnectionReconfiguration (step 13, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3-6: UEInformationRequest (steps 15 and 17, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3-7: *UEInformationResponse* (step 16, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>r1f-Report-r9</i> SEQUENCE { | | | |
| <i>measResultLastServCell-r9</i> SEQUENCE { | | Cell 3 | |
| <i>rsrpResult-r9</i> | (0..97) | | |
| <i>rsrqResult-r9</i> | Not present or (0..34) | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 3 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 3 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 3 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 3 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 6 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 6 | | |
| } | | | |
| timeConnFailure-r10 | Not present | | |
| connectionFailureType-r10 | r1f | | |
| previousPCellId-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.3.3-8: *UEInformationResponse* (step 18, Table 8.6.4.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rlf-Report-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.4.4 Radio Link Failure logging / Reporting at E-UTRA handover

8.6.4.4.1 Test Purpose (TP)

(1)

```
with { UE in RRC_CONNECTED state with T304 expiry and handover failure information available in
VarRLF-Report and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
ensure that {
  when { UE receives the RRCConnectionReestablishment message and completes the RRC Connection
Reestablishment successfully }
  then { UE sends the RRCConnectionReestablishmentComplete message including rlf-InfoAvailable }
```

(2)

```
with { UE in RRC_CONNECTED state with handover failure information available in VarRLF-Report and
plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
ensure that {
  when { UE receives RRCConnectionReconfiguration message includes the mobilityControlInfo and the
UE is able to comply with the configuration included in this message }
  then { UE sends the RRCConnectionReconfigurationComplete message with rlf-InfoAvailable included
}
}
```

(3)

```
with { UE in RRC_CONNECTED state with the handover failure information available in VarRLF-Report
and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
ensure that {
  when { UE receives the UEInformationRequest message with rlf-ReportReq set to true }
  then { UE sends the UEInformationResponse message with rlf-Report included }
}
```

(4)

```
with { UE in RRC_CONNECTED state with the handover failure information available in VarRLF-Report
and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
ensure that {
  when { UE receives the UEInformationRequest message with rlf-ReportReq set to true }
  then { UE sends the UEInformationResponse message with eestablishmentCellId set to the global
cell identity of the selected cell }
}
```

(5)

```
with { UE in RRC_CONNECTED state with the handover failure information available in VarRLF-Report
and plmn-Identity stored in VarRLF-Report is not equal to the RPLMN }
ensure that {
  when { UE receives the UEInformationRequest message with rlf-ReportReq set to true }
  then { UE sends the UEInformationResponse message without rlf-Report included }
}
```

8.6.4.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.4, 5.3.5.6, 5.3.7.4 and 5.6.5.3.

[TS 36.331, clause 5.3.5.4 (TP2)]

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

...

- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:
 - 3> include the *logMeasAvailable*;
- 1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission;

[TS 36.331, clause 5.3.5.6 (TP1)]

The UE shall:

- 1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

- 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;
- 2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof';
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.4 (TP4)]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

The UE shall set the contents of *RRCConnectionReestablishmentRequest* message as follows:

...

- 1> set the *reestablishmentCause* as follows:

...

- 2> else if the re-establishment procedure was initiated due to handover failure as specified in 5.3.5.6 (intra-LTE handover failure) or 5.4.3.5 (inter-RAT mobility from EUTRA failure):
 - 3> set the *reestablishmentCause* to the value *handoverFailure*;
- 2> else:
 - 3> set the *reestablishmentCause* to the value *otherFailure*;

The UE shall submit the *RRCConnectionReestablishmentRequest* message to lower layers for transmission.

[TS 36.331, clause 5.6.5.3 (TP3, TP5)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
- 1> if the *rlf-Report* is included in *UEInformationResponse*:
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.4.3 Test description

8.6.4.4.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 4 and Cell 28
- Each cell has only a single PLMN identity. The PLMNs are identified in the test by the identifiers in Table 8.6.4.4.3.1-1.

Table 8.6.4.4.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1,4 | PLMN1 |
| 28 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.4.4.3.3-19
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.4.3.2 Test procedure sequence

Table 8.6.4.4.3.2-1 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", "T2", "T3", "T4" and "T5" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.4.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 4 | Cell 28 | Remark |
|---|-----------------------|-----------|--------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | Off | -97 | The power level values are such that measurement results for Cell 1 (M1) and Cell 28 (M28) satisfy exit condition for event A3 ($M28 < M1$). |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | Off | -73 | The power level values are such that measurement results for Cell 1 (M1) and Cell 28 (M28) satisfy entry condition for event A3 ($M28 > M1$). |
| T2 | Cell-specific RS EPRE | dBm/15kHz | -85 | Off | Off | The power level values are assigned to satisfy $Srxlev_{Cell\ 28} < 0$ such that selecting Cell 1 is guaranteed (NOTE 1). |
| T3 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | Off | The power level values are such that measurement results for Cell 1 (M1) and Cell 4 (M4) satisfy entry condition for event A3 ($M4 > M1$). |
| T4 | Cell-specific RS EPRE | dBm/15kHz | Off | -85 | -73 | The power level values are such that measurement results for Cell 4 (M4) and Cell 28 (M28) satisfy entry condition for event A3 ($M28 > M4$). (NOTE 1). |
| T5 | Cell-specific RS EPRE | dBm/15kHz | Off | Off | -73 | The power level values are assigned to satisfy $Srxlev_{Cell\ 4} < 0$ such that selecting Cell 28 is guaranteed (NOTE 1). |
| NOTE 1: Power level "Off" is defined in TS36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.4.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|-----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to setup intra and inter frequency measurement on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 2 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 3 | The SS changes Cell 28 parameter according to the row "T1" in table 8.6.4.4.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 1 to report event A3 with the measured RSRP, RSRQ value for Cell 28. | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 5 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1 to order the UE to perform inter frequency handover to Cell 28. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| - | EXCEPTION: In parallel to the event described in step 6 the steps specified in Table 8.6.4.4.3.2-3 should take place. | - | - | - | - |
| 6 | Wait for 1 s to ensure that T304 expires. The SS changes Cell 28 parameter according to the row "T2" in table 8.6.4.4.3.2-1. | - | - | - | - |
| 7 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> message on Cell 1 | --> | <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> | - | - |
| 8 | The SS transmits an <i>RRCCONNECTIONREESTABLISHMENT</i> message to resume SRB1 operation and re-activate security on Cell 1. | <-- | <i>RRCCONNECTIONREESTABLISHMENT</i> | - | - |
| 9 | Check: Does the UE transmit an <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> message with <i>rlf-InfoAvailable</i> included? | --> | <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> | 1 | P |
| 10 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to resume existing radio bearer on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 11 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 12 | The SS changes Cell 4 parameter according to the row "T3" in table 8.6.4.4.3.2-1. | - | - | - | - |
| 13 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 1 to report event A3 with the measured RSRP, RSRQ value for Cell 4. | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 14 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1 to order the UE to perform intra frequency handover to Cell 4. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 15 | Check: Does the UE transmit an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 4 with <i>rlf-InfoAvailable</i> included? | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | 2 | P |
| 16 | The SS transmits a <i>UEINFORMATIONREQUEST</i> message with <i>rlf-ReportReq</i> set to <i>true</i> on Cell 4. | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 17 | Check: Does the UE transmit a <i>UEINFORMATIONRESPONSE</i> message on Cell 4 with <i>rlf-Report</i> included? Check: Does the <i>reestablishmentCellId</i> included in the <i>UEINFORMATIONRESPONSE</i> message equal to the global cell identity of Cell 1? | --> | <i>UEINFORMATIONRESPONSE</i> | 3,4 | P |
| 18 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |

| | | | | | |
|----|--|-----|---|---|---|
| | activate the measurement gaps on Cell 4 | | | | |
| 19 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message to confirm the activation of the measurement gaps on Cell 4. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 20 | The SS changes Cell 1, Cell 4 and Cell 28 parameters according to the row "T4" in table 8.6.4.4.3.2-1. | - | - | - | - |
| 21 | The UE transmits a <i>MeasurementReport</i> message on Cell 4 to report event A3 with the measured RSRP, RSRQ value for Cell 28. | --> | <i>MeasurementReport</i> | - | - |
| 22 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 4 to order the UE to perform inter frequency handover to Cell 28. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 21 the steps specified in Table 8.6.4.4.3.2-3 should take place. | - | - | - | - |
| 23 | The SS changes Cell 4 power level according to the row "T5" in table 8.6.4.4.3.2-1. | - | - | - | - |
| 24 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 28 | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 25 | The SS transmits an <i>RRCConnectionReestablishment</i> message to resume SRB1 operation and re-activate security on Cell 28. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 26 | Check: Does the UE transmit an <i>RRCConnectionReestablishmentComplete</i> message with <i>rlf-InfoAvailable</i> included? | --> | <i>RRCConnectionReestablishmentComplete</i> | 1 | P |
| 27 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume existing radio bearer on Cell 28. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 28 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 28. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 29 | The UE transmits a TRACKING AREA UPDATE REQUEST message on Cell 28. | - | - | - | - |
| 30 | SS responds with a TRACKING AREA UPDATE ACCEPT message. NOTE: The TAU is accepted with PLMN1 listed as an Equivalent PLMN | - | - | - | - |
| 31 | The UE transmits a TRACKING AREA UPDATE COMPLETE message. | - | - | - | - |
| 32 | The SS transmits a <i>UEInformationRequest</i> message with <i>rlf-ReportReq</i> set to <i>true</i> on Cell 28. | <-- | <i>UEInformationRequest</i> | - | - |
| 33 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 28 without <i>rlf-Report</i> included? | --> | <i>UEInformationResponse</i> | 5 | P |
| 34 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 28? | - | - | 1 | - |

Table 8.6.4.4.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the inter frequency handover using MAC Random Access Preamble on Cell 28. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.4.4.3.3 Specific message contents

Table 8.6.4.4.3.3-0: SystemInformationBlockType2 for Cell 1, Cell 4 and Cell 28 (preamble and all the steps in Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.3-12 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |

Table 8.6.4.4.3.3-1: RRCConnectionReconfiguration (step 1, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|
|--|

Table 8.6.4.4.3.3-2: MeasConfig (Table 8.6.4.4.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f6 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f6) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 2 entries | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| measId[2] | 2 | | |
| measObjectId[2] | IdMeasObject-f6 | | |
| reportConfigId[2] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-3: MeasurementReport (step 4, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 2 | | |
| measResultServCell SEQUENCE { | | Cell 1 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 28 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-4: RRCConnectionReconfiguration (step 5, step 14 and step 22, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition HO | | | |
|--|--|--|--|
| | | | |

Table 8.6.4.4.3.3-5: MobilityControlInfo (step 5, Table 8.6.4.4.3.3-4)

| Derivation Path: 36.308, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 28 | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 28 | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| rach-ConfigDedicated SEQUENCE { | | | |
| ra-PreambleIndex | 63 | | |
| ra-PRACH-MaskIndex | 0 | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-6: RRCConnectionReestablishmentRequest (step 7, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS. | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-7: RRCConnectionReestablishment (step 8, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-10 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishment ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionReestablishment-r8 SEQUENCE { | | | |
| nextHopChainingCount | 0 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-8: RRCConnectionReestablishmentComplete (step 9 and step 26, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-Info Available-r9 | true | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-9: RRCConnectionReconfiguration (step 10, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-10: MeasurementReport (step 13, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|-----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | Cell 1 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 4 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-11: MobilityControlInfo (step 14, Table 8.6.4.4.3.3-4)

| Derivation Path: 36.308, Table 4.6.5-1 | | | |
|--|-----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 4 | | |
| carrierFreq | Not present | | |
| rach-ConfigDedicated SEQUENCE { | | | |
| ra-PreambleIndex | 63 | | |
| ra-PRACH-MaskIndex | 0 | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-12: RRCConnectionReconfigurationComplete (step 15, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-9 | | | |
|---|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-UL | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r10 | true | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-13: UEInformationRequest (step 16 and step 32, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rlf-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-14: *UEInformationResponse* (step 17, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|---|--|--------------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>rif-Report-r9</i> SEQUENCE { | | | |
| <i>measResultLastServCell-r9</i> SEQUENCE { | | Cell 1 | |
| <i>rsrpResult-r9</i> | (0..97) | | |
| <i>rsrqResult-r9</i> | Not present or (0..34) | | |
| } | | | |
| <i>measResultNeighCells-r9</i> SEQUENCE { | | | |
| <i>measResultListEUTRA-r9</i> | 1 entry | | |
| SEQUENCE(SIZE(1..maxFreq)) OF SEQUENCE { | | | |
| <i>carrierFreq-r9</i> | The ARFCN of Cell 28 | | |
| <i>measResultList-r9</i> SEQUENCE (SIZE | | | |
| (1..maxCellReport)) OF SEQUENCE { | | | |
| <i>physCellId</i> | Phys cell id of cell 28 | | |
| <i>cgi-Info</i> | Not present | | |
| <i>measResult</i> SEQUENCE { | | | |
| <i>rsrpResult</i> | (0..97) | | |
| <i>rsrqResult</i> | Not present or (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| <i>locationInfo-r10</i> | Not present or any allowed value | | |
| <i>failedPCellId-r10</i> CHOICE { | <i>cellGlobalId-r10</i> or <i>pci-arfcn-r10</i> | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | Target PCell |
| <i>cellGlobalId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 28 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 28 | | |
| } | | | |
| <i>pci-arfcn-r10</i> SEQUENCE { | | | |
| <i>physCellId-r10</i> | PhysicalCellIdentity of Cell 28 | | |
| <i>carrierFreq-r10</i> | Same downlink EARFCN as used for Cell 28 | | |
| } | | | |
| } | | | |
| <i>reestablishmentCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | "Verify setting of reestablishment CellId in the VarRLF-Report to the global cell identity of the selected cell at | |

| | | | |
|--------------------------------|--|--|---------------|
| | | RRC connection re-establishment due to handover failure” | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| timeConnFailure-r10 | Not Checked/Present | | |
| connectionFailureType-r10 | hof | | |
| previousPCellId-r10 SEQUENCE { | | | Source PCell |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | plmn-Identity |
| cellIdentity | <i>cellIdentity</i> of Cell 1 | | cellIdentity |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-15: RRCConnectionReconfiguration (step 18, Table 8.6.4.4.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition MEAS

Table 8.6.4.4.3.3-16: MeasConfig (Table 8.6.4.4.3.3-15)

Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ

Table 8.6.4.4.3.3-17: *MeasurementReport* (step 19, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | Cell 4 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 28 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-18: *MobilityControlInfo* (step 22, Table 8.6.4.4.3.3-4)

| Derivation Path: 36.308, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 28 | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 28 | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| rach-ConfigDedicated SEQUENCE { | | | |
| ra-PreambleIndex | 63 | | |
| ra-PRACH-MaskIndex | 0 | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.19: RRCConnectionReestablishmentRequest (step 24, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 4 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS. | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.20: UEInformationResponse (step 33, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-UL | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rlf-Report-r9 SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.21: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

Table 8.6.4.4.3.22: TRACKING AREA UPDATE ACCEPT for Cell 28 (step 30, Table 8.6.4.4.3.2-2)

| Derivation path: 36.508 Table 4.7.2-24 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN1 | | |

8.6.4.5 Radio Link Failure logging / Reporting of ECGI of the PCell

8.6.4.5.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed intra-frequency handover and reported that the UE has
radio link failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing previousPCellId }
}

```

8.6.4.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.7.4, 5.3.7.5, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

- 1> set the content of *RRCCONNECTIONREESTABLISHMENTCOMPLETE* message as follows:

- 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include the *rlf-InfoAvailable*;

...

- 1> submit the *RRCCONNECTIONREESTABLISHMENTCOMPLETE* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or

- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or

- 1> upon indication from RLC that the maximum number of retransmissions has been reached:

- 2> consider radio link failure to be detected;

- 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:

- 3> clear the information included in *VarRLF-Report*, if any;

- 3> set the *plmn-Identity* to the RPLMN;

- 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;

- 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;

- 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;

- 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;

- 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48, hours after the radio link failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
- 1> if the *rlf-Report* is included in *UEInformationResponse*:
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.5.3 Test description

8.6.4.5.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.5.3.2 Test procedure sequence

Table 8.6.4.5.3.2-1 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", "T2" and "T3" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.5.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -91 | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy exit condition for event A3 ($M2 < M1$). |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -79 | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy entry condition for event A3 ($M2 > M1$). |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | "Off" | No Cells are available. (NOTE 1). |
| T3 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | -85 | Only Cell 2 is available. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.4.5.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup intra-frequency measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 2 parameter according to the row "T1" in Table 8.6.4.5.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to order the UE to perform intra-frequency handover to Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 6 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 7 | The SS changes Cell 1 and Cell 2 parameter according to the row "T2" in Table 8.6.4.5.3.2-1. | - | - | - | - |
| 8 | Wait for 5s to ensure that the UE detects T310 expiry. | - | - | - | - |
| 9 | The SS changes Cell 2 parameter according to the row "T3" in Table 8.6.4.5.3.2-1. | - | - | - | - |
| 10 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 11 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 12 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message with radio link failure information on Cell 2. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 13 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 14 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 15 | The SS transmits a <i>UEInformationRequest</i> message on Cell 2. | <-- | <i>UEInformationRequest</i> | - | - |
| 16 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 2? | --> | <i>UEInformationResponse</i> | 1 | P |
| 17 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |

8.6.4.5.3.3 Specific message contents

Table 8.6.4.5.3.3-1: *RRCConnectionReconfiguration* (step 1, Table 8.6.4.5.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.4.5.3.3-2: *MeasConfig* (Table 8.6.4.5.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfig[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.4.5.3.3-3: *MeasurementReport* (step 4, Table 8.6.4.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.5.3.3-4: *RRConnectionReconfiguration* (step 5, Table 8.6.4.5.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|

Table 8.6.4.5.3.3-5: *MobilityControlInfo* (Table 8.6.4.5.3.3-4)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.4.5.3.3-6: *RRCConnectionReestablishmentRequest* (step 10, Table 8.6.4.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.5.3.3-7: *RRCConnectionReestablishmentComplete* (step 12, Table 8.6.4.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rf-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.5.3.3-8: RRCConnectionReconfiguration (step 13, Table 8.6.4.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.5.3.3-9: UEInformationRequest (step 15, Table 8.6.4.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rlf-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.5.3.3-10: *UEInformationResponse* (step 16, Table 8.6.4.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>rif-Report-r9</i> SEQUENCE { | | | |
| <i>measResultLastServCell-r9</i> SEQUENCE { | | | |
| <i>rsrpResult-r9</i> | (0..97) | | |
| <i>rsrqResult-r9</i> | Not present or (0..34) | | |
| } | | | |
| <i>measResultNeighCells-r9</i> | Not present | | |
| <i>locationInfo-r10</i> | Not present or any allowed value | | |
| <i>failedPCellId-r10</i> CHOICE { | <i>cellGlobalId-r10</i> or <i>pci-arfcn-r10</i> | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| } | | | |
| <i>cellGlobalId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| <i>pci-arfcn-r10</i> SEQUENCE { | | | |
| <i>physCellId-r10</i> | Physical cell Identity of Cell 2 | | |
| <i>carrierFreq-r10</i> | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| <i>reestablishmentCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Any allowed value | | |
| <i>connectionFailureType-r10</i> | <i>rif</i> | | |
| <i>previousPCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |

| | | | |
|---|--|--|--|
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.4.6 Radio Link Failure logging / Reporting of RLF report availability / PLMN change

8.6.4.6.1 Test Purpose (TP)

(1)

```
with { UE in RRC_CONNECTED having detected radio link failure }
ensure that {
  when { UE moves to the cell that belongs to the PLMN different from the PLMN where the radio link
failure was detected }
  then { UE does not indicate IE rlf-InfoAvailable }
}
```

(2)

```
with { UE in RRC_CONNECTED having detected radio link failure }
ensure that {
  when { UE returns to the cell that belongs to the PLMN where the radio link failure was detected }
  then { UE indicates IE rlf-InfoAvailable }
}
```

8.6.4.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4 and 5.3.11.3.

[TS 36.331, clause 5.3.3.4 (TP1, TP2)]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include *rlf-InfoAvailable*;

...

2> submit the *RRCConnectionSetupComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.11.3 (TP1, TP2)]

The UE shall:

1> upon T310 expiry; or

1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or

1> upon indication from RLC that the maximum number of retransmissions has been reached:

2> consider radio link failure to be detected;

2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

- 3> set the *plmn-Identity* to the RPLMN;
- 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48, hours after the radio link failure is detected, upon power off or upon detach.

8.6.4.6.3 Test description

8.6.4.6.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.6.3.2 Test procedure sequence

Table 8.6.4.6.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1", "T2" and "T3" are applied at the points indicated in the Main behaviour description in Table 8.6.4.6.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.6.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|---|-----------------------|------------|--------|---------|--------------------------------------|
| T1 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | "Off" | No Cells are available. (NOTE 1). |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | -85 | Only Cell 12 is available. (NOTE 1). |
| T3 | Cell-specific RS EPRE | dBm/15k Hz | -85 | "Off" | Only Cell 1 is available. (NOTE 1). |
| NOTE 1: Power level "Off" is defined in TS36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.4.6.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|-----------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.4.6.3.2-1. | - | - | - | - |
| 2 | Wait for 15s. | - | - | - | - |
| 3 | The SS changes Cell 12 parameter according to the row "T2" in Table 8.6.4.6.3.2-1. | - | - | - | - |
| 4-5 | Steps 1 to 2 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 12. | - | - | - | - |
| 6 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message without radio link failure information on Cell 12? This message includes a TRACKING AREA UPDATE REQUEST message. | --> | <i>RRCConnectionSetupComplete</i> | 1 | P |
| 7-9 | Steps 4 to 6 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 12. Note: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 10 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 11 | The SS changes Cell 1 and Cell 12 parameters according to the row "T3" in Table 8.6.4.6.3.2-1. | - | - | - | - |
| 12-13 | Steps 1 to 2 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 1. | - | - | - | - |
| 14 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message with radio link failure information on Cell 1? This message includes a TRACKING AREA UPDATE REQUEST message. | --> | <i>RRCConnectionSetupComplete</i> | 2 | P |
| 15-17 | Steps 4 to 6 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 1. Note: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 18 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 19 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.2 indicate that the UE is in E-UTRA RRC_IDLE state on Cell 1? | - | - | 2 | - |

8.6.4.6.3.3 Specific message contents

Table 8.6.4.6.3.3-1: RRCConnectionSetupComplete (step 14, Table 8.6.4.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | native | | |
| rlf-InfoAvailable-r10 | true | | |
| logMeasAvailable-r10 | Not present | | |
| rn-SubframeConfigReq-r10 | Not present | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.4.7 Radio Link Failure logging / Location information

8.6.4.7.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the intra-frequency measurement and reported that the UE
has radio link failure information with location information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for intra-
frequency neighbour cell including locationCoordinates }
}

```

8.6.4.7.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 34.306, clause 4.3.13.2; TS 36.331, clause 5.3.11.3 and 5.6.5.3.

[TS 36.306, clause 4.3.13.2 (TP1)]

standaloneGNSS-Location

This parameter defines whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements in RRC_IDLE.

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;

- 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the radio link failure is detected.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
- 1> if the *rlf-Report* is included in *UEInformationResponse*:

- 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.7.3 Test description

8.6.4.7.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE: None.

Preamble:

- 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 36.509 [25] , if supported by the UE according to *pc_UpdateUE_LocationInformation* . Otherwise, or in addition any other suitable method may also be used.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.7.3.2 Test procedure sequence

Same test procedure as specified in 8.6.4.1.3.2 with the following exception:

- The specific message content for the *UEInformationResponse* message in Table 8.6.4.1.3.3-8 is replaced by the specific message content in Table 8.6.4.7.3.3-1.

8.6.4.7.3.3 Specific message contents

Table 8.6.4.7.3.3-1: *UEInformationResponse* (step 12, Table 8.6.4.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rf-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | Physical cell Identity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 SEQUENCE { | | | |
| locationCoordinates-r10 CHOICE { | | | |
| ellipsoid-Point-r10 | Any allowed value | | |
| ellipsoidPointWithAltitude-r10 | Any allowed value | | |
| } | | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN | | |

| | | | |
|--------------------------------------|--|--|--|
| | as used for Cell 1 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| timeConnFailure-r10 | Not present | | |
| connectionFailureType-r10 | <i>rlf</i> | | |
| previousPCellId-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.4.8 Radio Link Failure logging / Logging and reporting / Reporting at RRC connection establishment / PLMN list

8.6.4.8.1 Test Purpose (TP)

(1)

```
with { UE having completed the radio bearer establishment and initial security activation procedure
}
ensure that {
  when { UE detects radio link failure and T311 is expired and camp on a cell belonging to
equivalent PLMN }
  then { UE performs RRC Connection Establishment procedure and sends an
RRCConnectionSetupComplete message with rlf-InfoAvailable }
}
```

(2)

```
with { UE having sent an RRCConnectionSetupComplete message with rlf-InfoAvailable }
ensure that {
  when { UE receives a UEInformationRequest message with rlf-ReportReq set to true }
  then { UE sends a UEInformationResponse message with rlf-Report }
}
```

8.6.4.8.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.3.4]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable*;

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
 - 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
 - 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;
- ...
- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
 - 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
 - 3> if an *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> if the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo* concerned an intra E-UTRA handover:
 - 5> include the *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCONNECTIONRECONFIGURATION* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo*;
 - 4> if the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo* concerned a handover to E-UTRA from UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO:

- 5> include the *previousUTRA-CellId* and set it to the physical cell identity, the carrier frequency and the global cell identity, if available, of the UTRA Cell in which the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 3> set the *c-RNTI* to the C-RNTI used in the PCell;
- 3> set the *rlf-Cause* to the trigger for detecting radio link failure;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.8.3 Test description

8.6.4.8.3.1 Pre-test conditions

System Simulator:

- Cell 1 and 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.4.8.3.1-1.

Table 8.6.4.8.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.4.8.3.3-4
- The UE is in state Generic RB Established (State 3) on Cell 1 according to [18].

8.6.4.8.3.2 Test procedure sequence

Table 8.6.4.8.3.2-1 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 "T1" and "T2" are to be applied. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.8.3.2-1: Time instances of cell power level

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|----|-----------|---------------|--------|---------|----------------------------------|
| T1 | RS EPRE | dBm/15k Hz | "Off" | "Off" | No cell is available (NOTE 1) |
| T2 | RS EPRE | dBm/15k Hz | "Off" | -85 | (NOTE 1) |

NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1.

Table 8.6.4.8.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.4.8.3.2-1. | - | - | - | - |
| 2 | The SS waits for 12s to ensure that the UE detects T311 expiry. | - | - | - | - |
| 3 | The SS changes Cell 12 parameter according to the row "T2" in Table 8.6.4.8.3.2-1. | - | - | - | - |
| 4 | The UE transmits an <i>RRConnectionRequest</i> message on cell 12 to initiate a tracking area update procedure. | --> | <i>RRConnectionRequest</i> | - | - |
| 5 | The SS transmit an <i>RRConnectionSetup</i> message. | <-- | <i>RRConnectionSetup</i> | - | - |
| 6 | The UE transmits an <i>RRConnectionSetupComplete</i> message to confirm the successful completion of the connection establishment and a TRACKING AREA UPDATE REQUEST message is sent to update the registration of the actual tracking area. Check: Does the UE send an <i>RRConnectionSetupComplete</i> message with <i>rlf-InfoAvailable</i> on Cell 12? | --> | <i>RRConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST | 1 | P |
| 7-9 | Steps 4 to 6 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 12. NOTE: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 10-18 | Steps 1 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 12. | - | - | - | - |
| 19 | The SS sends a <i>UEInformationRequest</i> message to get <i>rlf-ReportReq</i> on Cell 12. | <-- | <i>UEInformationRequest</i> | - | - |
| 20 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>rlf-Report</i> on Cell 12? | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.4.8.3.3 Specific message contents

Table 8.6.4.8.3.3-1: *RRConnectionSetupComplete* (step 6, Table 8.6.4.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRConnectionSetupComplete</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r10 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.8.3.3-2: UEInformationRequest (step 19, Table 8.6.4.8.3.2-2)

Derivation Path: 36.508, Table 4.6.1-23A, condition RLF Report

Table 8.6.4.8.3.3-3: UEInformationResponse (step 20, Table 8.6.4.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| RLF-Report-r9 ::= SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 | Not present | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not Present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| timeSinceFailure-r11 | Any allowed value | | |
| } | | | |
| previousUTRA-CellId-r11 | Not present | | |
| selectedUTRA-CellId-r11 | Not present | | |
| } | | | |

Table 8.6.4.8.3.3-4: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.4.9 Radio Link Failure logging / Logging and reporting / Reporting at intra LTE handover / PLMN list

8.6.4.9.1 Test Purpose (TP)

(1)

```
with { UE having completed the radio bearer establishment and initial security activation procedure }
ensure that {
  when { UE performs RRC connection re-establishment procedure and intra-LTE handover procedure }
  then { UE sends an RRCConnectionReconfigurationComplete message with rlf-InfoAvailable }
}
```

(2)

```
with { UE having sent an RRCConnectionReconfigurationComplete message with rlf-InfoAvailable }
ensure that {
  when { UE receives a UEInformationRequest message with rlf-ReportReq set to true }
  then { UE sends a UEInformationResponse message with rlf-Report and PLMN list }
}
```

8.6.4.9.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.4, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.5.4]

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

...

1> set the content of *RRCConnectionReconfigurationComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable*;

[TS 36.331, clause 5.3.11.3]

The UE shall:

1> upon T310 expiry; or

1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or

1> upon indication from RLC that the maximum number of retransmissions has been reached:

2> consider radio link failure to be detected;

2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;

3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;

4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;

- 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
- 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
- 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
- 4> for each neighbour cell included, include the optional fields that are available;

...

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned an intra E-UTRA handover:
 - 5> include the *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned a handover to E-UTRA from UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO:
 - 5> include the *previousUTRA-CellId* and set it to the physical cell identity, the carrier frequency and the global cell identity, if available, of the UTRA Cell in which the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 3> set the *c-RNTI* to the C-RNTI used in the PCell;
- 3> set the *rlf-Cause* to the trigger for detecting radio link failure;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.9.3 Test description

8.6.4.9.3.1 Pre-test conditions

System Simulator:

- Cell 1 and 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.4.9.3.1-1.

Table 8.6.4.9.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.4.9.3.3-8.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.9.3.2 Test procedure sequence

Table 8.6.4.9.3.2-1 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 "T1", "T2" and "T3" are to be applied. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.9.3.2-1: Time instances of cell power level

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|--|-----------|------------|--------|---------|---|
| T1 | RS EPRE | dBm/15k Hz | "Off" | "Off" | No cell is available (NOTE 1) |
| T2 | RS EPRE | dBm/15k Hz | -85 | "Off" | (NOTE 1) |
| T3 | RS EPRE | dBm/15k Hz | -85 | -73 | The power level values are such that measurement results for Cell 1 (M1) and Cell 12 (M12) satisfy entry condition for event A3 (M12 > M1). |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.4.9.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.4.9.3.2-1. | - | - | - | - |
| 2 | The SS waits for 3s to ensure that the UE detects T310 expiry. | - | - | - | - |
| 3 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.4.9.3.2-1. | - | - | - | - |
| 4 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 1. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 5 | The SS transmits an <i>RRCConnectionReestablishment</i> message. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 6 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message on Cell 1. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 7 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume existing radio bearer on Cell 1 | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 8 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 9 | The SS changes Cell 1 and Cell 12 parameter according to the row "T3" in Table 8.6.4.9.3.2-1. | - | - | - | - |
| 10 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event A3 with the measured RSRP, RSRQ value for Cell 12. | --> | <i>MeasurementReport</i> | - | - |
| 11 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to order the UE to perform inter frequency handover to Cell 12. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 12 | Check: Does the UE send an <i>RRCConnectionSetupComplete</i> message with <i>rfl-InfoAvailable</i> on Cell 12? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 13-14 | Steps 4 to 5 of the generic test procedure in TS 36.508 subclause 6.4.2.7 are performed on Cell 12. NOTE: The UE performs a TAU procedure. | - | - | - | - |
| 15 | The SS sends a <i>UEInformationRequest</i> message to get <i>rfl-ReportReq</i> on Cell 12. | <-- | <i>UEInformationRequest</i> | - | - |
| 16 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>rfl-Report</i> on Cell 12? | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.4.9.3.3 Specific message contents

Table 8.6.4.9.3.3-1: RRCConnectionReestablishmentRequest (step 4, Table 8.6.4.9.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |

Table 8.6.4.9.3.3-2: RRCConnectionReconfiguration (step 7, Table 8.6.4.9.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.9.3.3-3: *MeasConfig* (step 7, Table 8.6.4.9.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f2) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f2 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.4.9.3.3-4: *MeasurementReport* (step 10, Table 8.6.4.9.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 12 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.9.3.3-5: RRCConnectionReconfigurationComplete (step 12, Table 8.6.4.9.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-9 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions SEQUENCE{ | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rif-InfoAvailable-r10 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.9.3.3-6: UEInformationRequest (step 15, Table 8.6.4.9.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition RLF Report |
|--|

Table 8.6.4.9.3.3-7: *UEInformationResponse* (step 16, Table 8.6.4.9.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 | Not present | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not Present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| timeConnFailure-r10 | Any allowed value | | |
| connectionFailureType-r10 | r1f | | |
| previousPCellId-r10 | Not present | | |
| failedPCellId-v1090 | Not present or any allowed value | | |
| basicFields-r11 SEQUENCE { | | | |

| | | | |
|-------------------------|-------------------|--|--|
| c-RNTI-r11 | Any allowed value | | |
| rlf-Cause-r11 | t310-Expiry | | |
| timeSinceFailure-r11 | Any allowed value | | |
| } | | | |
| previousUTRA-CellId-r11 | Not present | | |
| selectedUTRA-CellId-r11 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.9.3.3-8: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.4.10 Radio Link Failure logging / Logging and reporting / Reporting at RRC connection re-establishment / PLMN list

8.6.4.10.1 Test Purpose (TP)

(1)

```
with { UE having completed the radio bearer establishment and initial security activation procedure }
ensure that {
  when { UE detects T310 is expired and performs RRC Connection re-establishment procedure on a cell
    belonging to equivalent PLMN }
    then { UE sends an RRCCConnectionReestablishmentComplete message with rlf-InfoAvailable }
}
```

(2)

```
with { UE having sent an RRCCConnectionReestablishmentComplete message with rlf-InfoAvailable }
ensure that {
  when { UE receives a UEInformationRequest message with rlf-ReportReq set to true }
    then { UE sends a UEInformationResponse message with rlf-Report and PLMN list }
}
```

8.6.4.10.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.7.5, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

1> set the content of *RRCCConnectionReestablishmentComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include the *rlf-InfoAvailable*;

[TS 36.331, clause 5.3.11.3]

The UE shall:

1> upon T310 expiry; or

1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or

1> upon indication from RLC that the maximum number of retransmissions has been reached:

- 2> consider radio link failure to be detected;
- 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;
- ...
- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned an intra E-UTRA handover:
 - 5> include the *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned a handover to E-UTRA from UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO:
 - 5> include the *previousUTRA-CellId* and set it to the physical cell identity, the carrier frequency and the global cell identity, if available, of the UTRA Cell in which the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 3> set the *c-RNTI* to the C-RNTI used in the PCell;

- 3> set the *rlf-Cause* to the trigger for detecting radio link failure;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.4.10.3 Test description

8.6.4.10.3.1 Pre-test conditions

System Simulator:

- Cell 1 and 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.4.8.3.1-1.

Table 8.6.4.10.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.4.10.3.3-4
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.4.10.3.2 Test procedure sequence

Table 8.6.4.8.3.2-1 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 "T1" and "T2" are to be applied. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.4.10.3.2-1: Time instances of cell power level

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|--|-----------|---------------|--------|---------|----------------------------------|
| T1 | RS EPRE | dBm/15k Hz | "Off" | "Off" | No cell is available (NOTE 1) |
| T2 | RS EPRE | dBm/15k Hz | "Off" | -85 | (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.4.10.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.4.10.3.2-1. | - | - | - | - |
| 2 | The SS waits for 3s to ensure that the UE detects T310 expiry. | - | - | - | - |
| 3 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.4.10.3.2-1. | - | - | - | - |
| 4 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> message on Cell 12. | --> | <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> | - | - |
| 5 | The SS transmit an <i>RRCCONNECTIONREESTABLISHMENT</i> message. | <-- | <i>RRCCONNECTIONREESTABLISHMENT</i> | - | - |
| 6 | Check: Does the UE send an <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> message with <i>rlf-InfoAvailable</i> on Cell 12? | --> | <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> | 1 | P |
| 7 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to resume existing radio bearer on Cell 12 | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 8 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 12. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 7 | The SS sends a <i>UEINFORMATIONREQUEST</i> message to get <i>rlf-ReportReq</i> on Cell 12. | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 8 | Check: Does the UE send a <i>UEINFORMATIONRESPONSE</i> message with <i>rlf-Report</i> on Cell 12? | --> | <i>UEINFORMATIONRESPONSE</i> | 2 | P |

8.6.4.10.3.3 Specific message contents

Table 8.6.4.10.3.3-1: RRCConnectionReestablishmentComplete (step 6, Table 8.6.4.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReestablishmentComplete-r8 | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r9 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.10.3.3-2: UEInformationRequest (step 7, Table 8.6.4.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A, condition RLF |
|---|
| |

Table 8.6.4.10.3.3-3: *UEInformationResponse* (step 8, Table 8.6.4.10.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|---|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| RLF-Report-r9 ::= SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 | Not present | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not Present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| } | | | |
| connectionFailureType-r10 | r1f | | |
| previousPCellId-r10 | Not present or any allowed value | | |
| failedPCellId-v1090 | Not present or any allowed value | | |
| basicFields-r11 SEQUENCE { | | | |

| | | | |
|-------------------------|-------------------|--|--|
| c-RNTI-r11 | Any allowed value | | |
| rlf-Cause-r11 | t310-Expiry | | |
| timeSinceFailure-r11 | Any allowed value | | |
| } | | | |
| previousUTRA-CellId-r11 | Not present | | |
| selectedUTRA-CellId-r11 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.10.3.3-4: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.5 Inter-RAT Logged Radio Link Failure

8.6.5.1 Radio Link Failure logging / Reporting at UTRAN Inter-RAT handover

8.6.5.1.1 Test Purpose (TP)

(1)

```
with { UE selects the UTRAN cell and enters UTRA CELL_DCH(PS-DCCH+DTCH_DCH) after detection of radio link failure in an E-UTRAN cell }
ensure that {
  when { UE receives a HANDOVER FROM UTRAN COMMAND message including the eutra-Message }
  then { UE transmits an RRCConnectionReconfigurationComplete message containing rlf-InfoAvailable and enters E-UTRA RRC_CONNECTED state }
}
```

(2)

```
with { UE in RRC_CONNECTED having reported that the UE has radio link failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for UTRA neighbour cell }
}
```

8.6.5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.11.3, 5.4.2.3 and 5.6.5.3.

[TS 36.331, clause 5.3.11.3 (TP1, TP2)]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;

- 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48, hours after the radio link failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.4.2.3 (TP1)]

If the UE is able to comply with the configuration included in the *RRCCConnectionReconfiguration* message, the UE shall:

...

- 1> set the content of *RRCCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include *rlf-InfoAvailable*;

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.5.1.3 Test description

8.6.5.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cell.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.5.1.3.2 Test procedure sequence

Table 8.6.5.1.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1", "T2" and "T3" are applied at the points indicated in the Main behaviour description in Table 8.6.5.1.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.5.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Remark |
|--|--------------------------|--------------|--------|--------|--|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -80 | - | The power level values are such that entering conditions for event B2 are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -70 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -70 | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | "Off" | - | Only Cell 5 is available. (NOTE 1) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -70 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -70 | |
| T3 | Cell-specific RS EPRE | dBm/15kHz | -70 | - | The power level values are such that entering conditions for event 3a are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -100 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -100 | |
| NOTE 1: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.5.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 5 parameters according to the row "T1" in Table 8.6.5.1.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.5.1.3.2-1. | - | - | - | - |
| 6 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 7-11 | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA PS RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs NW initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | For UTRAN FDD, EXCEPTION: Steps 12a1 to 12a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. For UTRAN TDD, goto Step 13. | - | - | - | - |
| 12a1 | IF <i>pc_UTRA_CompressedModeRequired</i> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 12a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 13 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 14 | The SS changes Cell 1 and Cell 5 parameters according to the row "T3" in Table 8.6.5.1.3.2-1. | - | - | - | - |
| 15 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 16 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 17 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message with radio link failure information on Cell 1? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 18 | Generic test procedure in TS 36.508 subclause 6.4.2.10 is performed on Cell 1. NOTE: The UE performs tracking area updating procedure without ISR and security reconfiguration after successful completion of handover from UTRA. | - | - | - | - |
| 19 | The SS transmits a <i>UEInformationRequest</i> message on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 20 | Check: Does the UE transmit a | --> | <i>UEInformationResponse</i> | 2 | P |

| | | | | | |
|----|---|---|---|---|---|
| | <i>UEInformationResponse</i> message on Cell 1? | | | | |
| 21 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 2 | - |

8.6.5.1.3.3 Specific message contents

Table 8.6.5.1.3.3-1: *RRConnectionReconfiguration* (step 1, Table 8.6.5.1.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition MEAS

Table 8.6.5.1.3.3-2: *MeasConfig* (Table 8.6.5.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition UTRAN | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>MeasConfig</i> ::= SEQUENCE { | | | |
| <i>measObjectToAddModList</i> SEQUENCE (SIZE (1..maxObjectld)) OF SEQUENCE { | 2 entries | | |
| <i>measObjectld</i> [1] | IdMeasObject-f1 | | |
| <i>measObject</i> [1] | MeasObjectEUTRA-GENERIC(f1) | | |
| <i>measObjectld</i> [2] | IdMeasObject-f8 | | |
| <i>measObject</i> [2] | MeasObjectUTRA-f8 | | |
| } | | | |
| <i>reportConfigToAddModList</i> SEQUENCE (SIZE (1..maxReportConfigld)) OF SEQUENCE { | 1 entry | | |
| <i>reportConfigld</i> [1] | IdReportConfig-B2-UTRA | | |
| <i>reportConfig</i> [1] | ReportConfigInterRAT-B2-UTRA(-92, -82) | | |
| } | | | |
| <i>measIdToAddModList</i> SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| <i>measId</i> [1] | 1 | | |
| <i>measObjectld</i> [1] | IdMeasObject-f8 | | |
| <i>reportConfigld</i> [1] | IdReportConfig-B2-UTRA | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.5.1.3.3-3: *QuantityConfig* (Table 8.6.5.1.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-3A, condition UTRAN | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>QuantityConfig</i> ::= SEQUENCE { | | | |
| <i>quantityConfigUTRA</i> SEQUENCE { | | | |
| <i>measQuantityUTRA-FDD</i> | cpich-RSCP | | UTRA-FDD |
| <i>measQuantityUTRA-TDD</i> | pccpch-RSCP | | UTRA-TDD |
| <i>filterCoefficient</i> | fc0 | | |
| } | | | |
| <i>quantityConfigUTRA-v1020</i> | Not present | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.5.1.3.3-4: MeasObjectUTRA-f8 (Table 8.6.5.1.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-3 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectUTRA ::= SEQUENCE { | | | |
| carrierFreq | Same downlink ARFCN as used for Cell 5 | | |
| cellsToAddModList CHOICE { | | | |
| cellsToAddModListUTRA-FDD SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | UTRA-FDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 5 | | |
| } | | | |
| cellsToAddModListUTRA-TDD SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | UTRA-TDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 5 | | |
| } | | | |
| } | | | |
| csg-allowedReportingCells-v930 | Not present | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.5.1.3.3-5: MeasurementReport (step 4, Table 8.6.5.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId CHOICE { | | | |
| fdd | PhysicalCellIdentity of Cell 5 | | UTRA-FDD |
| tdd | PhysicalCellIdentity of Cell 5 | | UTRA-TDD |
| } | | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| utra-RSCP | (-5..91) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.5.1.3.3-6: HANDOVER FROM UTRAN COMMAND (step 16, Table 8.6.5.1.3.2-2)

Derivation Path: 36.508, Table 4.7B.1-2

Table 8.6.5.1.3.3-7: RRCConnectionReconfiguration (Table 8.6.5.1.3.3-6)

Derivation Path: 36.508, Table 4.6.1-8, condition HO-TO-EUTRA(1,0)

Table 8.6.5.1.3.3-8: *MobilityControlInfo* (Table 8.6.5.1.3.3-7)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 1. | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 1. | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| carrierBandwidth SEQUENCE { | | | |
| dl-Bandwidth | Same downlink system bandwidth as used for Cell 1 | | |
| ul-Bandwidth | Same uplink system bandwidth as used for Cell 1 | | FDD |
| ul-Bandwidth | Not present | | TDD |
| } | | | |
| additionalSpectrumEmission | 1 | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

Table 8.6.5.1.3.3-9: *SecurityConfigHO* (Table 8.6.5.1.3.3-7)

| Derivation Path: 36.508, Table 4.6.4-1 | | | |
|--|---|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| SecurityConfigHO ::= SEQUENCE { | | | |
| handoverType CHOICE { | | | |
| interRAT SEQUENCE { | | | |
| securityAlgorithmConfig SEQUENCE { | | | |
| cipheringAlgorithm | Set according to PIXIT parameter for default ciphering protection algorithm | | |
| integrityProtAlgorithm | Set according to PIXIT parameter for default integrity algorithm | | |
| } | | | |
| nas-SecurityParamToEUTRA | Octets 1 to 4 are arbitrarily selected. Bits 1 to 3 of octet 5 are set according to PIXIT parameter for default integrity protection algorithm. Bits 5 to 7 of octet 5 are set according to PIXIT parameter for default ciphering algorithm. Bits 1 to 3 of octet 6 are arbitrarily selected between '000'B and '110'B, different from the valid NAS key set identifier of the UE if such a value exists. Bit 4 of octet 6 is set to 1. | Octets 1 to 4 include the NonceMME value. Bits 1 to 3 of octet 5 include the Type of integrity protection algorithm Bits 5 to 7 of octet 5 include the Type of ciphering algorithm. Bits 1 to 4 of octet 6 include the NAS key set identifier. | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.1.3.3-10: *RRCConnectionReconfigurationComplete* (step 17, Table 8.6.5.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-9 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not present or any allowed value | | |
| nonCriticalExtension SEQUENCE { | | | |
| rf-InfoAvailable-r10 | true | | |
| logMeasAvailable-r10 | Not present | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.1.3.3-11: UEInformationRequest (step 19, Table 8.6.5.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.1.3.3-12: *UEInformationResponse* (step 20, Table 8.6.5.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rfl-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 | Not present | | |
| measResultListUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9 | Same downlink ARFCN as used for Cell 5 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId CHOICE { | | | |
| fdd | PhysicalCellIdentity of Cell 5 | | UTRA-FDD |
| tdd | PhysicalCellIdentity of Cell 5 | | UTRA-TDD |
| } | | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| utra-RSCP | Not present or (-5..91) | | |
| utra-EcN0 | Not present | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |

| | | | |
|---------------------------|-------------|--|--|
| } | | | |
| reestablishmentCellId-r10 | Not present | | |
| timeConnFailure-r10 | Not present | | |
| connectionFailureType-r10 | rlf | | |
| previousPCellId-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

8.6.5.2 Radio Link Failure logging / Reporting at GERAN Inter-RAT handover

8.6.5.2.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRAN RRC_CONNECTED state with radio link failure information available in VarRLF-Report }
ensure that {
  when { UE handovers back to E-UTRAN from GERAN with the RPLMN equalling to the plmn-Identity stored in VarRLF-Report }
  then { UE sends the RRCConnectionReconfigurationComplete message with rlf-InfoAvailable included }
}
```

(2)

```
with { UE in E-UTRAN RRC_CONNECTED state with the Inter-RAT GERAN neighbour cell measurement information configured and the radio link failure information available in VarRLF-Report }
ensure that {
  when { UE receives the UEInformationRequest message with rlf-ReportReq set to true and plmn-Identity stored in VarRLF-Report is equal to the RPLMN }
  then { UE sends the UEInformationResponse message with GERAN neighbour cell information (measResultListGERAN) included in measResultNeighCells }
}
```

8.6.5.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.11.3, 5.4.2.3 and 5.6.5.3.

[TS 36.331, clause 5.3.11.3 (TP1, TP2)]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the radio link failure is detected.

[TS 36.331, clause 5.4.2.3 (TP1)]

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

...

- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and *plmn-Identity* stored in *VarLogMeasReport* is equal to the RPLMN:

3> include the *logMeasAvailable*;

1> submit the *RRCCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.5.2.3 Test description

8.6.5.2.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 24 - Cell 1 and Cell 2 are E-UTRAN cell, Cell 24 is a GERAN cell.
- All cells belong to the same PLMN.
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.5.2.3.2 Test procedure sequence

Table 8.6.5.2.3.2-1 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", "T2" and "T3" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.5.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 24 | Remark |
|----|-----------------------|------------|--------|---------|--------|
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -80 | - | |
| | RSSI | dBm | - | [-65] | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | - | |
| | RSSI | dBm | - | [-65] | |
| T3 | Cell-specific RS EPRE | dBm/15k Hz | -60 | - | |
| | RSSI | dBm | - | [-85] | |

Table 8.6.5.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 and Cell 24 parameters according to the row "T1" in table 8.6.5.2.3.2-1. | - | - | - | - |
| 2 | The SS transmits an <i>RRConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 3 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1 to report event B2 with the measured rssi value for Cell 24. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 1 and Cell 24 parameters according to the row "T2" in Table 8.6.5.2.3.2-1 in order that the radio link quality of Cell 1 is degraded and Cell 24 is suitable for camping. | - | - | - | - |
| 6 | The UE executes the generic test procedure in TS 36.508 subclause 6.4.2.9 to make sure that the UE is camped on GERAN Cell 24 | - | - | - | - |
| 7 | The SS changes Cell 1 and Cell 24 parameters according to the row "T3" in table 8.6.5.2.3.2-1. | - | - | - | - |
| 8 | The SS transmits PS HANDOVER COMMAND message on Cell 24 to order the UE to perform inter-RAT handover to Cell 1. | <-- | PS HANDOVER COMMAND | - | - |
| 9 | Check: Does the UE transmit an <i>RRConnectionReconfigurationComplete</i> message on Cell 1 with <i>rlf-InfoAvailable</i> included? | --> | <i>RRConnectionReconfigurationComplete</i> | 1 | P |
| 10 | The UE transmits a TRACKING AREA UPDATE REQUEST message on Cell 1. | - | - | - | - |
| 11 | The SS transmits a NAS SECURITY MODE COMMAND message to activate NAS security (mapped security context) | <-- | RRC: <i>DLInformationTransfer</i> NAS: SECURITY MODE COMMAND | - | - |
| 12 | The UE transmits a NAS SECURITY MODE COMPLETE message and establishes the initial security configuration. | --> | RRC: <i>ULInformationTransfer</i> NAS: SECURITY MODE COMPLETE | - | - |
| 13 | SS responds with a TRACKING AREA UPDATE ACCEPT message. | - | RRC: <i>DLInformationTransfer</i> NAS: TRACKING AREA UPDATE ACCEPT | - | - |
| 14 | The UE transmits a TRACKING AREA UPDATE COMPLETE message. | - | RRC: <i>ULInformationTransfer</i> NAS: TRACKING AREA UPDATE COMPLETE | - | - |
| 15 | The SS transmits a <i>UEInformationRequest</i> message with <i>rlf-ReportReq</i> set to <i>true</i> on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 16 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 1 | --> | <i>UEInformationResponse</i> | 2 | P |

| | | | | | |
|----|---|---|---|---|---|
| | with the GERAN neighbour Cell 24 measurement information (<i>measResultListGERAN</i>) included in <i>rfl-Report</i> ? | | | | |
| 17 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 1 | - |

8.6.5.2.3.3 Specific message contents

Table 8.6.5.2.3.3-1: RRCConnectionReconfiguration (step 2, Table 8.6.5.2.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.5.2.3.3-2: MeasConfig (Table 8.6.5.2.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition GERAN | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f11 | | |
| measObject[2] | MeasObjectGERAN-GENERIC(f11) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-GERAN | | |
| reportConfig[1] | ReportConfigInterRAT-B2-GERAN(-69, [-79]) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f11 | | |
| reportConfigId[1] | IdReportConfig-B2-GERAN | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigGERAN SEQUENCE { | | | |
| measQuantityGERAN | rssI | | |
| filterCoefficient | fc0 | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.2.3.3-3: *MeasurementReport* (step 4, Table 8.6.5.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultsNeighCells CHOICE { | | | |
| measResultListGERAN SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| carrierFreq[1] SEQUENCE { | | | |
| arfcn | Not checked | | |
| bandIndicator | Not checked | | |
| } | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 24 | | |
| cgi-info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rssi | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.2.3.3-4: PS HANDOVER COMMAND (step 8, Table 8.6.5.2.3.3-2)

| Derivation Path: 44.060, Table 11.2.43.1 | | | |
|---|--|---------------|--------------------------------------|
| Information Element | Value/remark | Comment | Condition |
| PAGE MODE | '00'B | Normal Paging | |
| Global TFI | TFI of the downlink TBF | | |
| CONTAINER_ID | 0 | | |
| PS Handover to E-UTRAN Payload | '10'B | | |
| RRC Container IE | | | |
| RRC_CONTAINER_LENGTH | Length of the container data | | |
| RRC_CONTAINER_DATA | | | |
| RRCConnectionReconfiguration message | | | HO-TO-EUTRA |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | Derivation Path: 36.331 clause 6.2.2 |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-DL | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| measConfig | Not present | | |
| mobilityControlInfo | MobilityControlInfo | | HO-TO-EUTRA Ref Table 8.6.5.2.3.3-5 |
| dedicatedInfoNASList | Not present | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO-TO-EUTRA(n, m) | | HO-TO-EUTRA(n, m) |
| securityConfigHO | SecurityConfigHO | | HO-TO-EUTRA Ref Table 8.6.5.2.3.3-6 |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.2.3.3-5: MobilityControllInfo (Table 8.6.5.2.3.3-4)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControllInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 1. | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 1. | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| carrierBandwidth SEQUENCE { | | | |
| dl-Bandwidth | Downlink system bandwidth under test. | | |
| ul-Bandwidth | Uplink Bandwidth under test. | | FDD |
| | Not present | | TDD |
| } | | | |
| additionalSpectrumEmission | 1 | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

Table 8.6.5.2.3.3-6: SecurityConfigHO (Table 8.6.5.2.3.3-4)

| Derivation Path: 36.508, Table 4.6.4-1 | | | |
|--|---|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| SecurityConfigHO SEQUENCE { | | | |
| handoverType CHOICE{ | | | |
| interRAT SEQUENCE { | | | |
| securityAlgorithmConfig SEQUENCE { | | | |
| cipheringAlgorithm | Set according to PIXIT parameter for default ciphering protection algorithm | | |
| integrityProtAlgorithm | Set according to PIXIT parameter for default integrity algorithm | | |
| } | | | |
| nas-SecurityParamToEUTRA | Octets 1 to 4 are arbitrarily selected. Bits 1 to 3 of octet 5 are set according to PIXIT parameter for default integrity protection algorithm. Bits 5 to 7 of octet 5 are set according to PIXIT parameter for default ciphering algorithm. Bits 1 to 3 of octet 6 are arbitrarily selected between '000'B and '110'B, different from the valid NAS key set identifier of the UE if such a value exists. Bit 4 of octet 6 is set to 1. | Octets 1 to 4 include the NonceMME value. Bits 1 to 3 of octet 5 include the Type of integrity protection algorithm Bits 5 to 7 of octet 5 include the Type of ciphering algorithm. Bits 1 to 4 of octet 6 include the NAS key set identifier. | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.2.3.3-7: RRCConnectionReconfigurationComplete (step 9, Table 8.6.5.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-9 | | | |
|---|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-JL | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r10 | true | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.2.3.3-8: UEInformationRequest (step 15, Table 8.6.5.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.2.3.3-9: *UEInformationResponse* (step 16, Table 8.6.5.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>rif-Report-r9</i> SEQUENCE { | | | |
| <i>measResultLastServCell-r9</i> SEQUENCE { | | Cell 1 | |
| <i>rsrpResult-r9</i> | (0..97) | | |
| <i>rsrqResult-r9</i> | Not present or (0..34) | | |
| } | | | |
| <i>measResultNeighCells-r9</i> SEQUENCE { | | | |
| <i>measResultListGERAN-r9</i> | 1 entry | | |
| SEQUENCE(SIZE(1.. <i>maxCellReport</i>)) OF SEQUENCE { | | | |
| <i>carrierFreq-r9</i> SEQUENCE { | | | |
| <i>arfcn</i> | Downlink ARFCN of Cell 24 | | |
| <i>bandIndicator</i> | The same band indicator of the Cell 24 | | |
| } | | | |
| <i>physCellId</i> | 0001H | | |
| <i>cgi-Info</i> | Not present | | |
| <i>measResult</i> SEQUENCE { | | | |
| <i>rsqi</i> | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| <i>locationInfo-r10</i> | Not present or any allowed value | | |
| <i>failedPCellId-r10</i> CHOICE { | <i>cellGlobalId-r10</i> or <i>pci-arfcn-r10</i> | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| <i>cellGlobalId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| <i>pci-arfcn-r10</i> SEQUENCE { | | | |
| <i>physCellId-r10</i> | PhysicalCellIdentity of Cell 1 | | |
| <i>carrierFreq-r10</i> | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Not Present | | |
| <i>connectionFailureType-r10</i> | <i>rif</i> | | |
| <i>previousPCellId-r10</i> | Not Present | | |
| } | | | |
| } | | | |
| } | | | |

| | | | |
|---|--|--|--|
| } | | | |
| } | | | |

8.6.5.3 Radio Link Failure logging / Reporting CDMA2000 neighbour cell information

8.6.5.3.1 Test Purpose (TP)

(1)

```

with { UE in E-UTRAN RRC_CONNECTED state with the Inter-RAT cdma2000 neighbour cell measurement
information configured and the radio link failure information available in VarRLF-Report }
ensure that {
  when { UE receives the UEInformationRequest message with rlf-ReportReq set to true and plmn-
Identity stored in VarRLF-Report is equal to the RPLMN }
  then { UE sends the UEInformationResponse message with CDMA2000 neighbour cell information
(measResultsCDMA2000) included }
}

```

8.6.5.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.7.4, 5.3.11.3 and 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

The UE shall set the contents of *RRCCConnectionReestablishmentRequest* message as follows:

...

- 1> set the *reestablishmentCause* as follows:

...

- 2> else if the re-establishment procedure was initiated due to handover failure as specified in 5.3.5.6 (intra-LTE handover failure) or 5.4.3.5 (inter-RAT mobility from EUTRA failure):
 - 3> set the *reestablishmentCause* to the value *handoverFailure*;
- 2> else:
 - 3> set the *reestablishmentCause* to the value *otherFailure*;

The UE shall submit the *RRCCConnectionReestablishmentRequest* message to lower layers for transmission.

[TS 36.331, clause 5.3.11.3]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;

...

- 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* including the *mobilityControlInfo* message was received;
 - 4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the radio link failure is detected.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
- 1> if the *rlf-Report* is included in *UEInformationResponse*:
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.5.3.3 Test description

8.6.5.3.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 15 - Cell 1 and Cell 2 are E-UTRAN cell, Cell 15 is a CDMA2000 cell.
- All cells belong to the same PLMN.
- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3B) on Cell 1 according to [18].
- The UE has performed HRPD pre-registration on Cell 15.

8.6.5.3.3.2 Test procedure sequence

Table 8.6.5.3.3.2-1 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", "T2" and "T3" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.5.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 15 | |
|---|-----------------------|--------------|--------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -75 | "Off" | - | The power level values are such that camping on Cell 1 is guaranteed |
| | Ior/loc | dB | - | | -20 | |
| | loc | dBm/1.23 MHz | - | | -55 | |
| | Pilot Ec/Io (Note 1) | dB | - | | -20 | |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | "Off" | -75 | - | Radio link failure occurred in Cell 1 and UE re-establish on Cell 2 |
| | Ior/loc | dB | - | | -20 | |
| | loc | dBm/1.23 MHz | - | | -55 | |
| | Pilot Ec/Io (Note 1) | dB | - | | -20 | |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | | -80 | - | The power level values are such that entering conditions for event B2 on Cell 15 are satisfied |
| | Ior/loc | dB | - | | -5 | |
| | loc | dBm/1.23 MHz | - | | -55 | |
| | Pilot Ec/Io (Note 1) | dB | - | | -6 | |
| Note 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS. | | | | | | |

Table 8.6.5.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 2 parameters according to the row "T1" in Table 8.6.5.3.3.2-1 in order that the radio link quality of Cell 1 is degraded and Cell 2 is suitable for camping. | - | - | - | - |
| 4 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2 | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 5 | The SS transmits an <i>RRCConnectionReestablishment</i> message to resume SRB1 operation and re-activate security on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 6 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message with <i>rlf-InfoAvailable</i> included | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 7 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume existing radio bearer on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 8 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 9 | The SS changes Cell 2 and Cell 15 parameter according to the row "T2" in table 8.6.5.3.3.2-1. | - | - | - | - |
| 10 | The UE transmits a <i>MeasurementReport</i> message on Cell 2 to report event B2 with the measured pilotStrength value for Cell 15. | --> | <i>MeasurementReport</i> | - | - |
| 11 | The SS transmits a <i>UEInformationRequest</i> message with <i>rlf-ReportReq</i> set to <i>true</i> on Cell 2. | <-- | <i>UEInformationRequest</i> | - | - |
| 12 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 2 with the CDMA2000 neighbour Cell 15 measurement information (<i>measResultsCDMA2000</i>) included in <i>rlf-Report</i> ? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.5.3.3.3 Specific message contents

Table 8.6.5.3.3.3-1: *RRCConnectionReconfiguration* (step 1, Table 8.6.5.3.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.5.3.3.3-2: MeasConfig (Table 8.6.5.3.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f14 | | |
| measObject[2] | MeasObjectCDMA2000-GENERIC | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| reportConfig[1] | ReportConfigInterRAT-B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f14 | | |
| reportConfigId[1] | IdReportConfig-B2-CDMA2000 | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotStrength | | |
| } | | | |
| } | | | |
| measGapConfig SEQUENCE { | | | |
| gapActivation CHOICE { | | | |
| activate SEQUENCE { | | | |
| gapPattern CHOICE { | | | |
| gp1 SEQUENCE { | | | |
| gapOffset | 30 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3.3-3: MeasObjectCDMA2000-GENERIC (Table 8.6.5.3.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|---|------------------------------------|---------------------------------------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000-GENERIC ::= SEQUENCE { | | | |
| cdma2000-Type | TypeHRPD | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of frequency under test | | |
| arfcn | f14 | | |
| } | | | |
| SearchWindowSize | 15 | | |
| offsetFreq | db0 | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList CHOICE {} | Cell 15 | Listed cell parameters to be reported | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.6.5.3.3.3-4: RRCConnectionReestablishmentRequest (step 4, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS. | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3.3-5: RRCConnectionReestablishment (step 5, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-10 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishment ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReestablishment-r8 SEQUENCE { | | | |
| nextHopChainingCount | 0 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3.3-6: RRCConnectionReestablishmentComplete (step 6, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rf-InfoAvailable-r9 | true | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3.3-7: RRCConnectionReconfiguration (step 7, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3.3-8: MeasurementReport (step 10, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 ::=SEQUENCE { | | | |
| preRegistrationStatusHRPD | TRUE | | |
| measResultListCDMA2000 ::=SEQUENCE | 1 entry | Note 1 | |
| (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3.3-9: UEInformationRequest (step 11, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rlf-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.5.3.3-10: *UEInformationResponse* (step 12, Table 8.6.5.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rfl-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | Cell 1 | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultsCDMA2000-r9 | 1 entry | | |
| SEQUENCE(SIZE(1..maxFreq)) OF SEQUENCE { | | | |
| carrierFreq-r9 SEQUENCE { | | | |
| bandClass | | | |
| arfcn | The ARFCN of Cell 15 | | |
| } | | | |
| measResultList-r9 SEQUENCE (SIZE | | | |
| (1..maxCellReport)) OF SEQUENCE { | | | |
| preRegistrationStatusHRPD | true | | |
| measResultListCDMA2000 SEQUENCE | | | |
| (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId | Phys cell id of cell 15 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within | "Verify setting of | |

| | | | |
|---------------------------|---|--|--|
| | <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | reestablishment CellId in the VarRLF-Report to the global cell identity of the selected cell at RRC connection re-establishment due to handover failure" | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| timeConnFailure-r10 | Not Present | | |
| connectionFailureType-r10 | rlf | | |
| previousPCellId-r10 | Not Present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.6 Logged Handover Failure

8.6.6.1 Handover Failure logging / Reporting of Intra-frequency measurements

8.6.6.1.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the intra-frequency measurement and reported that the UE
has handover failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for intra-
frequency neighbour cell }
}

```

8.6.6.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.6, 5.3.7.4, 5.3.7.5 and 5.6.5.3.

[TS 36.331, clause 5.3.5.6]

The UE shall:

1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-Identity* to the RPLMN;

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof';
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the failure is detected.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include the *rlf-InfoAvailable*;

...

- 1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

- 1> if the *rlf-Report* is included in *UEInformationResponse*:

- 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.6.1.3 Test description

8.6.6.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.1.3.2 Test procedure sequence

Table 8.6.6.1.3.2-1 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" and "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.6.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -91 | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy exit condition for event A3 (M2 < M1). |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -79 | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy entry condition for event A3 (M2 > M1). |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | -85 | "Off" | Only Cell 1 is available. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.6.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to setup intra-frequency measurement on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 2 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 3 | The SS changes Cell 2 parameters according to the row "T1" in Table 8.6.6.1.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 1. | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 5 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message including <i>MOBILITYCONTROLLINFO</i> on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 6 the steps specified in Table 8.6.6.1.3.2-3 should take place. | - | - | - | - |
| 6 | The SS changes Cell 2 parameter according to the row "T2" in Table 8.6.6.1.3.2-1. | - | - | - | - |
| 7 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> message on Cell 1. | --> | <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> | - | - |
| 8 | The SS transmits an <i>RRCCONNECTIONREESTABLISHMENT</i> message on Cell 1. | <-- | <i>RRCCONNECTIONREESTABLISHMENT</i> | - | - |
| 9 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> | - | - |
| 10 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 11 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 12 | The SS transmits a <i>UEINFORMATIONREQUEST</i> message on Cell 1. | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 13 | Check: Does the UE transmit a <i>UEINFORMATIONRESPONSE</i> message on Cell 1? | --> | <i>UEINFORMATIONRESPONSE</i> | 1 | P |
| 14 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 1 | - |

Table 8.6.6.1.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the intra-frequency handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.6.1.3.3 Specific message contents

Table 8.6.6.1.3.3-1: *RRCCONNECTIONRECONFIGURATION* (step 1, Table 8.6.6.1.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.6.1.3.3-2: *MeasConfig* (Table 8.6.6.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfig[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.6.1.3.3-3: *MeasurementReport* (step 4, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present or any allowed value | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |

Table 8.6.6.1.3.3-4: RRCConnectionReconfiguration (step 5, Table 8.6.6.1.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition HO

Table 8.6.6.1.3.3-5: MobilityControlInfo (Table 8.6.6.1.3.3-4)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.6.1.3.3-6: RRCConnectionReestablishmentRequest (step 7, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.1.3.3-7: RRCConnectionReestablishmentComplete (step 9, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-Info Available-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.1.3.3-8: RRCConnectionReconfiguration (step 10, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.1.3.3-9: UEInformationRequest (step 12, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rlf-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.1.3.3-10: *UEInformationResponse* (step 13, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|---------------------------------------|--|--|--|
| | <i>ype1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Any allowed value | | |
| <i>connectionFailureType-r10</i> | hof | | |
| <i>previousPCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.6.2 Handover Failure logging / Reporting of Inter-frequency measurements

8.6.6.2.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the inter-frequency measurement and reported that the UE
has handover failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for inter-
frequency neighbour cell }
}

```

8.6.6.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.6, 5.3.7.4, 5.3.7.5 and 5.6.5.3.

[TS 36.331, clause 5.3.5.6]

The UE shall:

1> if T304 expires (handover failure):

NOTE: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-Identity* to the RPLMN;

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof';
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the failure is detected.

NOTE 2: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:
 - 3> include the *rlf-InfoAvailable*;

...

1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.6.2.3 Test description

8.6.6.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 3
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.2.3.2 Test procedure sequence

Table 8.6.6.2.3.2-1 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" and "T2" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.6.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -97 | The power level values are such that measurement results for Cell 1 (M1) and Cell 3 (M3) satisfy exit condition for event A3 (M3 < M1). |
| T1 | Cell-specific RS EPRE | dBm/15k Hz | -85 | -73 | The power level values are such that measurement results for Cell 1 (M1) and Cell 3 (M3) satisfy entry condition for event A3 (M3 > M1). |
| T2 | Cell-specific RS EPRE | dBm/15k Hz | -85 | "Off" | Only Cell 1 is available. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.6.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to setup inter-frequency measurement on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 2 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 3 | The SS changes Cell 3 parameters according to the row "T1" in Table 8.6.6.2.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 1. | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 5 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message including <i>MOBILITYCONTROLLINFO</i> on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 6 the steps specified in Table 8.6.6.2.3.2-3 should take place. | - | - | - | - |
| 6 | The SS changes Cell 3 parameter according to the row "T2" in Table 8.6.6.2.3.2-1. | - | - | - | - |
| 7 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> message on Cell 1. | --> | <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> | - | - |
| 8 | The SS transmits an <i>RRCCONNECTIONREESTABLISHMENT</i> message on Cell 1. | <-- | <i>RRCCONNECTIONREESTABLISHMENT</i> | - | - |
| 9 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> | - | - |
| 10 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 11 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 12 | The SS transmits a <i>UEINFORMATIONREQUEST</i> message on Cell 1. | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 13 | Check: Does the UE transmit a <i>UEINFORMATIONRESPONSE</i> message on Cell 1? | --> | <i>UEINFORMATIONRESPONSE</i> | 1 | P |
| 14 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 1? | - | - | 1 | - |

Table 8.6.6.2.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the inter-frequency handover using MAC Random Access Preamble on Cell 3. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.6.2.3.3 Specific message contents

Table 8.6.6.2.3.3-1: *RRCCONNECTIONRECONFIGURATION* (step 1, Table 8.6.6.2.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.6.2.3.3-2: *MeasConfig* (Table 8.6.6.2.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f2) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f2 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-3: *MeasurementReport* (step 4, Table 8.6.6.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 3 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-4: RRCConnectionReconfiguration (step 5, Table 8.6.6.2.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition HO

Table 8.6.6.2.3.3-5: MobilityControlInfo (Table 8.6.6.2.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 3 | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 3 | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-6: RRCConnectionReestablishmentRequest (step 7, Table 8.6.6.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-7: RRCConnectionReestablishmentComplete (step 9, Table 8.6.6.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|--|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rif-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-8: RRCConnectionReconfiguration (step 10, Table 8.6.6.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-9: UEInformationRequest (step 12, Table 8.6.6.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rlf-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.2.3.3-10: *UEInformationResponse* (step 13, Table 8.6.6.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 3 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 3 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 3 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 3 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 3 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 3 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|--------------------------------|--|--|--|
| | <i>ype1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| timeConnFailure-r10 | Any allowed value | | |
| connectionFailureType-r10 | hof | | |
| previousPCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.6.3 Handover Failure logging / Reporting of HOF report availability / PLMN change

8.6.6.3.1 Test Purpose (TP)

(1)

```
with { UE in RRC_CONNECTED having detected handover failure }
ensure that {
  when { UE moves to the cell that belongs to the PLMN different from the PLMN where the handover failure was detected }
  then { UE does not indicate IE rlf-InfoAvailable }
}
```

(2)

```
with { UE in RRC_CONNECTED having detected handover failure }
ensure that {
  when { UE returns to the cell that belongs to the PLMN where the handover failure was detected }
  then { UE indicates IE rlf-InfoAvailable }
}
```

8.6.6.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4 and 5.3.5.6.

[TS 36.331, clause 5.3.3.4 (TP1, TP2)]

The UE shall:

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include *rlf-InfoAvailable*;

...

- 2> submit the *RRCCONNECTIONSETUPCOMPLETE* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.5.6 (TP1, TP2)]

The UE shall:

- 1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

- 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;
- 2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCONNECTIONRECONFIGURATION* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof';
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

8.6.6.3.3 Test description

8.6.6.3.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.3.3.2 Test procedure sequence

Table 8.6.6.3.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1", "T2", "T3", and "T4" are applied at the points indicated in the Main behaviour description in Table 8.6.6.3.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.6.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 12 | Remark |
|--|-----------------------|-----------|--------|--------|---------|---|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | "Off" | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy entry condition for event A3 ($M2 > M1$). (NOTE 1) |
| T2 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -79 | "Off" | Only Cell 2 is available. (NOTE1) |
| T3 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -85 | -73 | The power level values are assigned to satisfy $R_{Cell\ 2} < R_{Cell\ 12}$. (NOTE 1) |
| T4 | Cell-specific RS EPRE | dBm/15kHz | -73 | "Off" | -85 | The power level values are assigned to satisfy $R_{Cell\ 1} > R_{Cell\ 12}$. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.6.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message to setup intra-frequency measurement on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 2 parameters according to the row "T1" in Table 8.6.6.3.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits an <i>RRConnectionReconfiguration</i> message including <i>mobilityControlInfo</i> on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 6 the steps specified in Table 8.6.6.3.3.2-3 should take place. | - | - | - | - |
| 6 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.6.3.3.2-1. | - | - | - | - |
| 7 | The UE transmits an <i>RRConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRConnectionReestablishmentRequest</i> | - | - |
| 8 | The SS transmits an <i>RRConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRConnectionReestablishment</i> | - | - |
| 9 | The UE transmits an <i>RRConnectionReestablishmentComplete</i> message with handover failure information on Cell 2. | --> | <i>RRConnectionReestablishmentComplete</i> | - | - |
| 10 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 11 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 12 | The SS transmits an <i>RRConnectionRelease</i> message on Cell 2. | <-- | <i>RRConnectionRelease</i> | - | - |
| 13 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 14 | The SS changes Cell 2 and Cell 12 parameters according to the row "T3" in Table 8.6.6.3.3.2-1. | - | - | - | - |
| 15-16 | Steps 1 to 2 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 12. | - | - | - | - |
| 17 | Check: Does the UE transmit an <i>RRConnectionSetupComplete</i> message without handover failure information on Cell 12? This message includes a TRACKING AREA UPDATE REQUEST message. | --> | <i>RRConnectionSetupComplete</i> | 1 | P |
| 18-20 | Steps 4 to 6 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 12. Note: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 21 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 22 | The SS changes Cell 1, Cell 2 and Cell 12 parameters according to the row "T4" in Table 8.6.6.3.3.2-1. | - | - | - | - |
| 23-24 | Steps 1 to 2 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 1. | - | - | - | - |

| | | | | | |
|-------|--|-----|-----------------------------------|---|---|
| 25 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message with handover failure information on Cell 1? This message includes a TRACKING AREA UPDATE REQUEST message. | --> | <i>RRCConnectionSetupComplete</i> | 2 | P |
| 26-28 | Steps 4 to 6 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 1. Note: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 29 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 30 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.2 indicate that the UE is in E-UTRA RRC_IDLE state on Cell 1? | - | - | 2 | - |

Table 8.6.6.3.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the intra-frequency handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.6.3.3.3 Specific message contents

Table 8.6.6.3.3.3-1: *SystemInformationBlockType2* for Cell 2 (preamble and all steps, Table 8.6.6.3.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| lateNonCriticalExtension | Not present | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |

Table 8.6.6.3.3.3-2: *RRCConnectionReconfiguration* (step 1, Table 8.6.6.3.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.6.3.3-3: MeasConfig (Table 8.6.6.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfig[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-4: MeasurementReport (step 4, Table 8.6.6.3.3-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-5: RRCConnectionReconfiguration (step 5, Table 8.6.6.3.3-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|

Table 8.6.6.3.3.3-6: *MobilityControlInfo* (Table 8.6.6.3.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.6.3.3.3-7: *RRCConnectionReestablishmentRequest* (step 7, Table 8.6.6.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3.3-8: *RRCConnectionReestablishmentComplete* (step 9, Table 8.6.6.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rif-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-9: RRCConnectionReconfiguration (step 10, Table 8.6.6.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDe dedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-10: RRCConnectionSetupComplete (step 25, Table 8.6.6.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | native | | |
| rlf-InfoAvailable-r10 | true | | |
| logMeasAvailable-r10 | Not present | | |
| rn-SubframeConfigReq-r10 | Not present | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.6.4 Handover Failure logging / Location information

8.6.6.4.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the intra-frequency measurement and reported that the UE
has handover failure information with location information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for intra-
frequency neighbour cell including locationCoordinates }
}

```

8.6.6.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 34.306, clause 4.3.13.2; TS 36.331, clause 5.3.5.6 and 5.6.5.3.

[TS 36.306, clause 4.3.13.2 (TP1)]

standaloneGNSS-Location

This parameter defines whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements in RRC_IDLE.

[TS 36.331, clause 5.3.5.6]

The UE shall:

1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-Identity* to the RPLMN;

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;

3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;

4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

3> if detailed location information is available, set the content of the *locationInfo* as follows:

4> include the *locationCoordinates*;

4> include the *horizontalVelocity*, if available;

3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRConnectionReconfiguration* message including *mobilityControlInfo* was received;

3> set the *timeConnFailure* to the elapsed time since reception of the last *RRConnectionReconfiguration* message including the *mobilityControlInfo*;

3> set the *connectionFailureType* to 'hof';

2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report* 48 hours after the failure is detected.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.6.4.3 Test description

8.6.6.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- 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 36.509 [25], if supported by the UE according to *pc_UpdateUE_LocationInformation*. Otherwise, or in addition any other suitable method may also be used.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.4.3.2 Test procedure sequence

Same test procedure as specified in 8.6.6.1.3.2 with the following exception:

- The specific message content for the *UEInformationResponse* message in Table 8.6.6.1.3.3-10 is replaced by the specific message content in Table 8.6.6.4.3.3-1.

8.6.6.4.3.3 Specific message contents

Table 8.6.6.4.3.3-1: *UEInformationResponse* (step 13, Table 8.6.6.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 SEQUENCE { | | | |
| locationCoordinates-r10 CHOICE { | | | |
| ellipsoid-Point-r10 | Any allowed value | | |
| ellipsoidPointWithAltitude-r10 | Any allowed value | | |
| } | | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq-r10 | Same downlink EARFCN | | |

| | | | |
|--------------------------------------|--|--|--|
| | as used for Cell 2 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| timeConnFailure-r10 | Any allowed value | | |
| connectionFailureType-r10 | hof | | |
| previousPCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.6.5 Handover Failure logging / Logging and reporting / Reporting at RRC connection establishment / PLMN list

8.6.6.5.1 Test Purpose (TP)

(1)

```
with { UE in RRC_CONNECTED having detected handover failure }
ensure that {
  when { UE reselects to a cell that belongs to a PLMN which is different from the PLMN where the
handover failure was detected but included in the plmn_IdentityList stored in VarRLF-Report }
  then { UE transmits the RRCCConnectionSetupComplete with IE rlf-InfoAvailable included }
}
```

(2)

```
with { UE indicated the availability of handover failure information in RRCCConnectionSetupComplete
message and the RPLMN is included in plmn-IdentityList stored in VarRLF-Report: }
ensure that {
  when { UE receives a UEInformationRequest message with rlf-ReportReq set to true }
  then { UE transmits a UEInformationResponse message including rlf-Report }
}
```

8.6.6.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4, 5.3.5.6 and 5.6.5.3. Unless otherwise stated these are Rel-11 requirements.

[TS 36.331, clause 5.3.3.4 (TP1, TP2)]

The UE shall:

- 1> set the content of *RRCCConnectionSetupComplete* message as follows:

...

- 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
- 3> include *rlf-InfoAvailable*;

...

- 2> submit the *RRCConnectionSetupComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.5.6 (TP1, TP2)]

The UE shall:

- 1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

- 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;
- 2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;

- 3> set the *connectionFailureType* to 'hof';
- 3> set the *c-RNTI* to the C-RNTI used in the source PCell;
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

- ...
- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- ...
- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.6.5.3 Test description

8.6.6.5.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.6.5.3.1-1.

Table 8.6.6.5.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1, 2 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.6.5.3.3-13.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.5.3.2 Test procedure sequence

Table 8.6.6.5.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.6.6.5.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.6.5.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 12 | Remark |
|--|-----------------------|-----------|--------|--------|---------|--|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | "Off" | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy entry condition for event A3 ($M2 > M1$). (NOTE 1) |
| T2 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -85 | -73 | The power level values are assigned to satisfy $R_{\text{Cell 2}} < R_{\text{Cell 12}}$. (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.6.5.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|-------|---|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup intra-frequency measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 2 parameters according to the row "T1" in Table 8.6.6.5.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 1 to order the UE to perform intra frequency handover to Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 6 the steps specified in Table 8.6.6.5.3.2-3 should take place. | - | - | - | - |
| 6 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 7 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 8 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message with <i>rif-InfoAvailable</i> on Cell 2. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 9 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to resume existing radio bearer on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 10 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 11 | The SS transmits an <i>RRCConnectionRelease</i> message on Cell 2. | <-- | <i>RRCConnectionRelease</i> | - | - |
| 12 | Wait for 5 s for the UE to enter E-UTRA RRC_IDLE state. | - | - | - | - |
| 13 | The SS changes Cell 1, Cell 2 and Cell 12 parameters according to the row "T2" in Table 8.6.6.5.3.2-1. | - | - | - | - |
| 14-15 | Steps 1 to 2 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 12. | - | - | - | - |
| 16 | Check: Does the UE transmit an <i>RRCConnectionSetupComplete</i> message with <i>rif-InfoAvailable</i> on Cell 12? | --> | RRC: <i>RRCConnectionSetupComplete</i> NAS: TRACKING AREA UPDATE REQUEST | 1 | P |
| 17-19 | Steps 4 to 6 of the generic test procedure in TS 36.508 [18] subclause 6.4.2.7 are performed on Cell 12. Note: The UE performs a TAU procedure and the RRC connection is released. | - | - | - | - |
| 20-27 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 12. | - | - | - | - |
| 28 | The SS sends a <i>UEInformationRequest</i> message with <i>rif-ReportReq</i> set to true. | <-- | <i>UEInformationRequest</i> | - | - |
| 29 | Check: Does the UE transmit a <i>UEInformationResponse</i> message including <i>rif-Report</i> ? | --> | <i>UEInformationResponse</i> | 2 | P |

Table 8.6.6.5.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the intra-frequency handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.6.5.3.3 Specific message contents

Table 8.6.6.5.3.3-1: SystemInformationBlockType2 for Cell 2 (preamble and all steps, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| lateNonCriticalExtension | Not present | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|
|--|

Table 8.6.6.5.3.3-3: MeasConfig (Table 8.6.6.5.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-4: MeasurementReport (step 4, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | Cell 1 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-5: RRCConnectionReconfiguration (step 5, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|
| |

Table 8.6.6.5.3.3-6: MobilityControlInfo (Table 8.6.6.5.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.6.5.3.3-7: RRCConnectionReestablishmentRequest (step 6, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the C-RNTI used in the Cell 1 | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-8: RRCConnectionReestablishmentComplete (step 8, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| r11-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-9: RRCConnectionReconfiguration (step 9, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-10: RRCConnectionSetupComplete (step 16, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| selectedPLMN-Identity | PLMN2 | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| gummei-Type-r10 | native | | |
| rlf-InfoAvailable-r10 | true | | |
| logMeasAvailable-r10 | Not present | | |
| m-SubframeConfigReq-r10 | Not present | | |
| nonCriticalExtension | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-11: UEInformationRequest (step 28, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A, condition RLF report |
|--|
| |

Table 8.6.6.5.3.3-12: *UEInformationResponse* (step 29, Table 8.6.6.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | Cell 1 | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 | Not present | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|---------------------------------------|--|--|--|
| | <i>type1</i> broadcasted in Cell 2 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Any allowed value | Time from UE receive HO command to the failure | |
| <i>connectionFailureType-r10</i> | hof | | |
| <i>previousPCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| <i>basicFields-r11</i> SEQUENCE { | | | |
| <i>c-RNTI-r11</i> | C-RNTI used in Cell 1 | | |
| <i>rlf-Cause-r11</i> | randomAccessProblem | | |
| <i>timeSinceFailure-r11</i> | Any value | Time elapsed from connection failure | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.5.3.3-13: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.6.6 Handover Failure logging / Logging and reporting / Reporting at intra LTE handover / PLMN list

8.6.6.6.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having detected handover failure }
ensure that {
  when { UE handovers to another cell that belongs to a PLMN which is different from the PLMN where the handover failure was detected but included in the plmn-IdentityList stored in VarRLF-Report }
  then { UE transmits the RRCConnectionReconfigurationComplete with IE rlf-InfoAvailable included }
}

```

(2)

```

with { UE indicated the availability of handover failure information in RRCConnectionReconfigurationComplete message and the RPLMN is included in plmn-IdentityList stored in VarRLF-Report }
ensure that {
  when { UE receives a UEInformationRequest message with rlf-ReportReq set to true }
  then { UE transmits a UEInformationResponse message including rlf-Report }
}

```

8.6.6.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.4, 5.3.5.6 and 5.6.5.3. Unless otherwise stated these are Rel-11 requirements.

[TS 36.331, clause 5.3.5.4 (TP1, TP2)]

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

...

1> set the content of *RRCConnectionReconfigurationComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable*;

2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable*;

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable*;

1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission;

[TS 36.331, clause 5.3.5.6 (TP1, TP2)]

The UE shall:

1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;

3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;

4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

4> for each neighbour cell included, include the optional fields that are available;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

3> if detailed location information is available, set the content of the *locationInfo* as follows:

4> include the *locationCoordinates*;

4> include the *horizontalVelocity*, if available;

3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRConnectionReconfiguration* message including *mobilityControlInfo* was received;

3> set the *timeConnFailure* to the elapsed time since reception of the last *RRConnectionReconfiguration* message including the *mobilityControlInfo*;

3> set the *connectionFailureType* to 'hof';

3> set the *c-RNTI* to the C-RNTI used in the source PCell;

2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;

2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.6.6.3 Test description

8.6.6.6.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.6.6.3.1-1.

Table 8.6.6.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1, 2 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.6.3.3-13.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.3.2 Test procedure sequence

Table 8.6.6.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.6.6.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.6.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 12 | Remark |
|--|-----------------------|-----------|--------|--------|---------|--|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | "Off" | The power level values are such that measurement results for Cell 1 (M1) and Cell 2 (M2) satisfy entry condition for event A3 ($M2 > M1$). (NOTE 1) |
| T2 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -85 | -73 | The power level values are such that measurement results for Cell 2 (M2) and Cell 12 (M12) satisfy entry condition for event A3 ($M12 > M2$). (NOTE 1) |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.6.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to setup intra and inter frequency measurement on Cell 1. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 2 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 1. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 2 parameters according to the row "T1" in Table 8.6.6.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 1. | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 5 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 1 to order the UE to perform intra frequency handover to Cell 2. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 6 the steps specified in Table 8.6.6.3.2-3 should take place. | - | - | - | - |
| 6 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> message on Cell 2. | --> | <i>RRCCONNECTIONREESTABLISHMENTREQUEST</i> | - | - |
| 7 | The SS transmits an <i>RRCCONNECTIONREESTABLISHMENT</i> message on Cell 2. | <-- | <i>RRCCONNECTIONREESTABLISHMENT</i> | - | - |
| 8 | The UE transmits an <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> message with <i>rlf-InfoAvailable</i> on Cell 2. | --> | <i>RRCCONNECTIONREESTABLISHMENTCOMPLETE</i> | - | - |
| 9 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message to resume existing radio bearer on Cell 2. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 10 | The UE transmits an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 2. | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | - | - |
| 11 | The SS changes Cell 1, Cell 2 and Cell 12 parameters according to the row "T2" in Table 8.6.6.3.2-1. | - | - | - | - |
| 12 | The UE transmits a <i>MEASUREMENTREPORT</i> message on Cell 2 to report event A3 with the measured RSRP, RSRQ value for Cell 12. | --> | <i>MEASUREMENTREPORT</i> | - | - |
| 13 | The SS transmits an <i>RRCCONNECTIONRECONFIGURATION</i> message on Cell 2 to order the UE to perform inter frequency handover to Cell 12. | <-- | <i>RRCCONNECTIONRECONFIGURATION</i> | - | - |
| 14 | Check: Does the UE transmit an <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> message on Cell 12 with <i>rlf-InfoAvailable</i> included? | --> | <i>RRCCONNECTIONRECONFIGURATIONCOMPLETE</i> | 1 | P |
| 15 | The SS sends a <i>UEINFORMATIONREQUEST</i> message with <i>rlf-ReportReq</i> set to true. | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 16 | Check: Does the UE send a <i>UEINFORMATIONRESPONSE</i> message including <i>rlf-Report</i> ? | --> | <i>UEINFORMATIONRESPONSE</i> | 2 | P |

Table 8.6.6.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the intra-frequency handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.6.3.3 Specific message contents

Table 8.6.6.3.3-1: SystemInformationBlockType2 for Cell 2 (preamble and all steps, Table 8.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| lateNonCriticalExtension | Not present | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |

Table 8.6.6.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|
| |

Table 8.6.6.3.3-3: *MeasConfig* (Table 8.6.6.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f2) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 2 entries | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| measId[2] | 2 | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| reportConfigId[2] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.6.6.3.3-4: MeasurementReport (step 4, Table 8.6.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | Cell 1 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.6.3.3-5: RRCConnectionReconfiguration (step 5, Table 8.6.6.6.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|

Table 8.6.6.6.3.3-6: MobilityControlInfo (Table 8.6.6.6.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.6.3.3-7: RRCConnectionReestablishmentRequest (step 6, Table 8.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the C-RNTI used in the Cell 1 | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-8: RRCConnectionReestablishmentComplete (step 8, Table 8.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-9: RRCConnectionReconfiguration (step 9, Table 8.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.4.4.3.3-10: *MeasurementReport* (step 12, Table 8.6.4.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 2 | | |
| measResultPCell SEQUENCE { | | Cell 2 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 12 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.6.3.3-11: *RRCConnectionReconfigurationComplete* (step 14, Table 8.6.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-9 | | | |
|---|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-UL | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rif-InfoAvailable-r10 | true | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.6.3.3-12: *UEInformationRequest* (step 15, Table 8.6.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A, condition RLF report |
|--|
|--|

Table 8.6.6.3.3-13: *UEInformationResponse* (step 16, Table 8.6.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>rif-Report-r9</i> SEQUENCE { | | | |
| <i>measResultLastServCell-r9</i> SEQUENCE { | | Cell 1 | |
| <i>rsrpResult-r9</i> | (0..97) | | |
| <i>rsrqResult-r9</i> | Not present or (0..34) | | |
| } | | | |
| <i>measResultNeighCells-r9</i> SEQUENCE { | | | |
| <i>measResultListEUTRA-r9</i> SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| <i>carrierFreq-r9</i> [1] | Same downlink EARFCN as used for Cell 2 | | |
| <i>measResultList-r9</i> [1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| <i>physCellId</i> [1] | PhysicalCellIdentity of Cell 2 | | |
| <i>cgi-Info</i> [1] | Not present | | |
| <i>measResult</i> [1] SEQUENCE { | | | |
| <i>rsrpResult</i> | (0..97) | | |
| <i>rsrqResult</i> | (0..34) | | |
| <i>additionalSI-Info-r9</i> | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| <i>measResultListUTRA-r9</i> | Not present | | |
| <i>measResultListGERAN-r9</i> | Not present | | |
| <i>measResultsCDMA2000-r9</i> | Not present | | |
| } | | | |
| <i>locationInfo-r10</i> | Not present or any allowed value | | |
| <i>failedPCellId-r10</i> CHOICE { | <i>cellGlobalId-r10</i> or <i>pci-arfcn-r10</i> | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| <i>cellGlobalId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| <i>pci-arfcn-r10</i> SEQUENCE { | | | |
| <i>physCellId-r10</i> | PhysicalCellIdentity of Cell 2 | | |
| <i>carrierFreq-r10</i> | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| <i>reestablishmentCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|---------------------------------------|--|--|--|
| | <i>type1</i> broadcasted in Cell 2 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Any allowed value | Time from UE receive HO command to the failure | |
| <i>connectionFailureType-r10</i> | hof | | |
| <i>previousPCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| <i>basicFields-r11</i> SEQUENCE { | | | |
| <i>c-RNTI-r11</i> | C-RNTI used in Cell 1 | | |
| <i>rlf-Cause-r11</i> | randomAccessProblem | | |
| <i>timeSinceFailure-r11</i> | Any allowed value | Time elapsed from connection failure | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.3.3-14: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.6.7 Handover Failure logging / Logging and reporting / Reporting at RRC connection re-establishment / PLMN list

8.6.6.7.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having detected handover failure }
ensure that {
  when { UE re-establishes to a cell that belongs to a PLMN which is different from the PLMN where the handover failure was detected but included in the plmn-IdentityList stored in VarRLF-Report }
  then { UE transmits the RRCConnectionReestablishmentComplete with IE rlf-InfoAvailable included }
}

```

(2)

```

with { UE indicated the availability of handover failure information in RRCConnectionReestablishmentComplete message and the RPLMN is included in plmn-IdentityList stored in VarRLF-Report }
ensure that {
  when { UE receives a UEInformationRequest message with rlf-ReportReq set to true }
  then { UE transmits a UEInformationResponse message including rlf-Report }
}

```

8.6.6.7.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.6, 5.3.7.5 and 5.6.5.3. Unless otherwise stated these are Rel-11 requirements.

[TS 36.331, clause 5.3.5.6 (TP1, TP2)]

The UE shall:

1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE anymore.

2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;

3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;

4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

4> for each neighbour cell included, include the optional fields that are available;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

3> if detailed location information is available, set the content of the *locationInfo* as follows:

4> include the *locationCoordinates*;

4> include the *horizontalVelocity*, if available;

3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCONNECTIONRECONFIGURATION* message including *mobilityControlInfo* was received;

3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo*;

3> set the *connectionFailureType* to 'hof';

3> set the *c-RNTI* to the C-RNTI used in the source PCell;

- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.5 (TP1)]

The UE shall:

...

- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 3> include the *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 3> include the *connEstFailInfoAvailable*;
- 1> perform the measurement related actions as specified in 5.5.6.1;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission;
- 1> if *SystemInformationBlockType15* is broadcast by the PCell:
 - 2> if the UE has transmitted an *MBMSInterestIndication* message during the last 1 second preceding detection of radio link failure:
 - 3> ensure having a valid version of *SystemInformationBlockType15* for the PCell;
 - 3> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;
 - 3> initiate transmission of the *MBMSInterestIndication* message in accordance with 5.8.5.4;
- 1> the procedure ends;

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.6.7.3 Test description

8.6.6.7.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 12
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.
- The PLMNs are identified in the test by the identifiers in Table 8.6.6.7.3.1-1.

Table 8.6.6.7.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.6.7.3.3-12.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.6.7.3.2 Test procedure sequence

Table 8.6.6.7.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1" are applied at the points indicated in the Main behaviour description in Table 8.6.6.7.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.6.7.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 12 | Remark |
|----|-----------------------|-----------|--------|---------|---|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | -79 | The power level values are such that measurement results for Cell 1 (M1) and Cell 12 (M12) satisfy entry condition for event A3 (M12 > M1). |

Table 8.6.6.7.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message to setup inter-frequency measurement on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 12 parameters according to the row "T1" in Table 8.6.6.7.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS transmits an <i>RRConnectionReconfiguration</i> message on Cell 1 to order the UE to perform inter frequency handover to Cell 12. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 6 the steps specified in Table 8.6.6.7.3.2-3 should take place. | - | - | - | - |
| 6 | The UE transmits an <i>RRConnectionReestablishmentRequest</i> message on Cell 12. | --> | <i>RRConnectionReestablishmentRequest</i> | - | - |
| 7 | The SS transmits an <i>RRConnectionReestablishment</i> message on Cell 12. | <-- | <i>RRConnectionReestablishment</i> | - | - |
| 8 | Check: Does the UE transmit an <i>RRConnectionReestablishmentComplete</i> message with <i>rlf-InfoAvailable</i> on Cell 12? | --> | <i>RRConnectionReestablishmentComplete</i> | 1 | P |
| 9 | The SS transmits an <i>RRConnectionReconfiguration</i> message to resume existing radio bearer on Cell 12. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 10 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message on Cell 12. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 11 | The SS sends a <i>UEInformationRequest</i> message with <i>rlf-ReportReq</i> set to true. | <-- | <i>UEInformationRequest</i> | - | - |
| 12 | Check: Does the UE transmit a <i>UEInformationResponse</i> message including <i>rlf-Report</i> ? | --> | <i>UEInformationResponse</i> | 2 | P |

Table 8.6.6.7.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the inter-frequency handover using MAC Random Access Preamble on Cell 12. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.6.7.3.3 Specific message contents

Table 8.6.6.7.3.3-1: SystemInformationBlockType2 for Cell 12 (preamble and all steps, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| lateNonCriticalExtension | Not present | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |

Table 8.6.6.7.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS | | | |
|--|--|--|--|
|--|--|--|--|

Table 8.6.6.7.3.3-3: MeasConfig (Table 8.6.6.7.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 1 entry | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f2) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f2 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.6.7.3.3-4: MeasurementReport (step 4, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | Cell 1 | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 12 | Cell 12 | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.7.3.3-5: RRCConnectionReconfiguration (step 5, Table 8.6.6.7.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|

Table 8.6.6.7.3.3-6: MobilityControlInfo (Table 8.6.6.7.3.3-5)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 12 | | |
| carrierFreq | Same downlink EARFCN as used for Cell 12 | | |
| } | | | |

Table 8.6.6.7.3.3-7: RRCConnectionReestablishmentRequest (step 6, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the C-RNTI used in the Cell 1 | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.7.3.3-8: RRCConnectionReestablishmentComplete (step 8, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.7.3.3-9: RRCConnectionReconfiguration (step 9, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.7.3.3-10: UEInformationRequest (step 11, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A, condition RLF report | | | |
|--|--|--|--|
| | | | |

Table 8.6.6.7.3.3-11: *UEInformationResponse* (step 12, Table 8.6.6.7.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|---|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse-r9</i> ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse-r9</i> SEQUENCE { | | | |
| <i>rif-Report-r9</i> SEQUENCE { | | | |
| <i>measResultLastServCell-r9</i> SEQUENCE { | | | |
| <i>rsrpResult-r9</i> | (0..97) | Cell 1 | |
| <i>rsrqResult-r9</i> | Not present or (0..34) | | |
| } | | | |
| <i>measResultNeighCells-r9</i> SEQUENCE { | | | |
| <i>measResultListEUTRA-r9</i> SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| <i>carrierFreq-r9</i> [1] | Same downlink EARFCN as used for Cell 12 | | |
| <i>measResultList-r9</i> [1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| <i>physCellId</i> [1] | PhysicalCellIdentity of Cell 12 | | |
| <i>cgi-Info</i> [1] | Not present | | |
| <i>measResult</i> [1] SEQUENCE { | | | |
| <i>rsrpResult</i> | (0..97) | | |
| <i>rsrqResult</i> | (0..34) | | |
| <i>additionalSI-Info-r9</i> | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| <i>measResultListUTRA-r9</i> | Not present | | |
| <i>measResultListGERAN-r9</i> | Not present | | |
| <i>measResultsCDMA2000-r9</i> | Not present | | |
| } | | | |
| <i>locationInfo-r10</i> | Not present or any allowed value | | |
| <i>failedPCellId-r10</i> CHOICE { | <i>cellGlobalId-r10</i> or <i>pci-arfcn-r10</i> | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| <i>cellGlobalId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| } | | | |
| <i>pci-arfcn-r10</i> SEQUENCE { | | | |
| <i>physCellId-r10</i> | PhysicalCellIdentity of Cell 12 | | |
| <i>carrierFreq-r10</i> | Same downlink EARFCN as used for Cell 12 | | |
| } | | | |
| } | | | |
| } | | | |
| <i>reestablishmentCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockT</i> | | |

| | | | |
|---------------------------------------|--|--|--|
| | <i>type1</i> broadcasted in Cell 12 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 12 | | |
| } | | | |
| <i>timeConnFailure-r10</i> | Any allowed value | Time from UE receive HO command to the failure | |
| <i>connectionFailureType-r10</i> | <i>hof</i> | | |
| <i>previousPCellId-r10</i> SEQUENCE { | | | |
| <i>plmn-Identity</i> | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| <i>cellIdentity</i> | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| <i>basicFields-r11</i> SEQUENCE { | | | |
| <i>c-RNTI-r11</i> | C-RNTI used in Cell 1 | | |
| <i>rlf-Cause-r11</i> | <i>randomAccessProblem</i> | | |
| <i>timeSinceFailure-r11</i> | Any value | Time elapsed from connection failure | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.6.7.3.3-12: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

8.6.7 Inter-RAT Logged Handover Failure

8.6.7.1 Handover Failure logging / Reporting of UTRAN Inter-RAT measurements

8.6.7.1.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the UTRA measurement and reported that the UE has
handover failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for UTRA
neighbour cell }
}

```

8.6.7.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.6, 5.3.7.4, 5.3.7.5 and 5.6.5.3.

[TS 36.331, clause 5.3.5.6]

The UE shall:

1> if T304 expires (handover failure):

NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

- 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;
- 2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCONNECTIONRECONFIGURATION* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof';
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.4]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

[TS 36.331, clause 5.3.7.5]

The UE shall:

...

1> set the content of *RRCConnectionReestablishmentComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include the *rlf-InfoAvailable*;

...

1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.7.1.3 Test description

8.6.7.1.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 5
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.7.1.3.2 Test procedure sequence

Table 8.6.7.1.3.2-1 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", "T2" and "T3" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause

Table 8.6.7.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 5 | Remark |
|----|--------------------------|--------------|--------|--------|--------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | -60 | - | The power level values are such that entering conditions for event A3 and event B2 are not satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | - | -88 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | - | -88 | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -84 | -84 | - | The power level values are such that entering conditions for event B2 are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | - | -64 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | - | -64 | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | -80 | -74 | - | The power level values are such that entering conditions for event A3 are satisfied. (NOTE 1) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | - | "Off" | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | - | "Off" | |
| T3 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -74 | - | Only Cell 2 is available. (NOTE 1,NOTE 2) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | - | "Off" | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | - | "Off" | |

NOTE 1: Power level "Off" for UTRA cell is defined in TS 34.108 Table 6.1.4.

NOTE 2: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1.

Table 8.6.7.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1, Cell 2 and Cell 5 parameters according to the row "T1" in Table 8.6.7.1.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 2 and Cell 5 parameters according to the row "T2" in Table 8.6.7.1.3.2-1. | - | - | - | - |
| 6 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 7 | The SS transmits an <i>RRCConnectionReconfiguration</i> message including <i>mobilityControllInfo</i> on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 8 the steps specified in Table 8.6.7.1.3.2-3 should take place. | - | - | - | - |
| 8 | The SS changes Cell 1 parameter according to the row "T3" in Table 8.6.7.1.3.2-1. | - | - | - | - |
| 9 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 10 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 11 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message with handover failure information on Cell 2. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 12 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 13 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 14 | The SS transmits a <i>UEInformationRequest</i> message on Cell 2. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 2? | --> | <i>UEInformationResponse</i> | 1 | P |
| 16 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |

Table 8.6.7.1.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform the handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.7.1.3.3 Specific message contents

Table 8.6.7.1.3.3-1: SystemInformationBlockType2 for Cell 2 (preamble and all steps, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| } | | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |
| } | | | |

Table 8.6.7.1.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS | | | |
|--|--|--|--|
|--|--|--|--|

Table 8.6.7.1.3.3-3: MeasConfig (Table 8.6.7.1.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition UTRAN | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f8 | | |
| measObject[2] | MeasObjectUTRA-f8 | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 2 entries | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| reportConfigId[2] | IdReportConfig-B2-UTRA | | |
| reportConfig[2] | ReportConfigInterRAT-B2-UTRA(-72, -76) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 2 entries | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| measId[2] | 2 | | |
| measObjectId[2] | IdMeasObject-f8 | | |
| reportConfigId[2] | IdReportConfig-B2-UTRA | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.1.3.3-4: QuantityConfig (Table 8.6.7.1.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-3A, condition UTRAN | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| QuantityConfig SEQUENCE { | | | |
| quantityConfigUTRA SEQUENCE { | | | |
| measQuantityUTRA-FDD | cpich-RSCP | | UTRA-FDD |
| measQuantityUTRA-TDD | pccpch-RSCP | | UTRA-TDD |
| filterCoefficient | fc0 | | |
| } | | | |
| quantityConfigUTRA-v1020 | Not present | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.1.3.3-5: MeasObjectUTRA-f8 (Table 8.6.7.1.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-3 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectUTRA ::= SEQUENCE { | | | |
| carrierFreq | Same downlink ARFCN as used for Cell 5 | | |
| cellsToAddModList CHOICE { | | | |
| cellsToAddModListUTRA-FDD SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | UTRA-FDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 5 | | |
| } | | | |
| cellsToAddModListUTRA-TDD SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | UTRA-TDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 5 | | |
| } | | | |
| } | | | |
| csg-allowedReportingCells-v930 | Not present | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.1.3.3-6: *MeasurementReport* (step 4, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 2 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] CHOICE { | | | |
| fdd | PhysicalCellIdentity of Cell 5 | | UTRA-FDD |
| tdd | PhysicalCellIdentity of Cell 5 | | UTRA-TDD |
| } | | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| utra-RSCP | Not present or (-5..91) | | |
| utra-EcN0 | Not present | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.1.3.3-7: MeasurementReport (step 6, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.1.3.3-8: RRCConnectionReconfiguration (step 7, Table 8.6.7.1.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|

Table 8.6.7.1.3.3-9: MobilityControlInfo (Table 8.6.7.1.3.3-8)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.7.1.3.3-10: RRCConnectionReestablishmentRequest (step 9, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.1.3.3-11: RRCConnectionReestablishmentComplete (step 11, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.1.3.3-12: RRCConnectionReconfiguration (step 12, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.1.3.3-13: UEInformationRequest (step 14, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.1.3.3-14: *UEInformationResponse* (step 15, Table 8.6.7.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|---|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink ARFCN as used for Cell 5 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] CHOICE { | | | |
| fdd | Physical cell Identity of Cell 5 | | UTRA-FDD |
| tdd | Physical cell Identity of Cell 5 | | UTRA-TDD |
| } | | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| utra-RSCP | Not present or (-5..91) | | |
| utra-EcN0 | Not present | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |

| | | | |
|--------------------------------------|--|--|--|
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 2 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| timeConnFailure-r10 | Any allowed value | | |
| connectionFailureType-r10 | hof | | |
| previousPCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

8.6.7.2 Handover Failure logging / Reporting of GERAN Inter-RAT measurements

8.6.7.2.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the GERAN measurement and reported that the UE has
handover failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for GERAN
neighbour cell }
}

```

8.6.7.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.6, 5.3.7.4, 5.3.7.5 and 5.6.5.3.

[TS 36.331, clause 5.3.5.6(TP1)]

The UE shall:

1> if T304 expires (handover failure):

NOTE: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:

3> clear the information included in *VarRLF-Report*, if any;

3> set the *plmn-Identity* to the RPLMN;

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;

3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;

4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;

4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

3> if detailed location information is available, set the content of the *locationInfo* as follows:

4> include the *locationCoordinates*;

4> include the *horizontalVelocity*, if available;

3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;

3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;

3> set the *connectionFailureType* to 'hof';

2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 2: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.4(TP1)]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

The UE shall set the contents of *RRCCConnectionReestablishmentRequest* message as follows:

...

1> set the *reestablishmentCause* as follows:

...

2> else if the re-establishment procedure was initiated due to handover failure as specified in 5.3.5.6 (intra-LTE handover failure) or 5.4.3.5 (inter-RAT mobility from EUTRA failure):

3> set the *reestablishmentCause* to the value *handoverFailure*;

[TS 36.331, clause 5.3.7.5(TP1)]

The UE shall:

...

1> set the content of *RRCCConnectionReestablishmentComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include the *rlf-InfoAvailable*;

...

1> submit the *RRCCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3(TP1)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.7.2.3 Test description

8.6.7.2.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 24 - Cell 1 and Cell 2 are E-UTRAN cell, Cell 24 is a GERAN cell.
- All cells belong to the same PLMN.
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.7.2.3.2 Test procedure sequence

Table 8.6.7.2.3.2-1 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", "T2" and "T3" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause

Table 8.6.7.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 24 | Remark |
|--|-----------------------|-----------|--------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | -60 | - | The power level values are such that entering conditions for event A3 and event B2 are not satisfied. |
| | RSSI | dBm | | | -85 | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -80 | -80 | - | The power level values are such that entering conditions for event B2 are satisfied. |
| | RSSI | dBm | | | -65 | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | -80 | -74 | - | The power level values are such that entering conditions for event A3 are satisfied. (NOTE 1) |
| | RSSI | dBm | - | - | "Off" | |
| T3 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -74 | - | Only Cell 2 is available. (NOTE 1,NOTE 2) |
| | RSSI | dBm | - | - | "Off" | |
| NOTE 1: Power level "Off" for GERAN cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |
| NOTE 2: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |

Table 8.6.7.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1, Cell 2 and Cell 24 parameters according to the row "T1" in Table 8.6.7.2.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 2 and Cell 24 parameters according to the row "T2" in Table 8.6.7.2.3.2-1. | - | - | - | - |
| 6 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 7 | The SS transmits an <i>RRCConnectionReconfiguration</i> message including <i>mobilityControlInfo</i> on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 8 the steps specified in Table 8.6.7.2.3.2-3 should take place. | - | - | - | - |
| 8 | The SS changes Cell 1 parameter according to the row "T3" in Table 8.6.7.2.3.2-1. | - | - | - | - |
| 9 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 10 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 11 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message with handover failure information on Cell 2. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 12 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 13 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 14 | The SS transmits a <i>UEInformationRequest</i> message on Cell 2. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 2? | --> | <i>UEInformationResponse</i> | 1 | P |
| 16 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |

Table 8.6.7.2.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.7.2.3.3 Specific message contents

Table 8.6.7.2.3.3-1: SystemInformationBlockType2 for Cell 2 (preamble and all steps, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |

Table 8.6.7.2.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS | | | |
|--|--|--|--|
|--|--|--|--|

Table 8.6.7.2.3.3-3: MeasConfig (Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition GERAN | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f11 | | |
| measObject[2] | MeasObjectGERAN-GENERIC(f11) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 2 entries | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| reportConfigId[2] | IdReportConfig-B2-GERAN | | |
| reportConfig[2] | ReportConfigInterRAT-B2-GERAN(-69, [-79]) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 2 entries | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| measId[2] | 2 | | |
| measObjectId[2] | IdMeasObject-f11 | | |
| reportConfigId[2] | IdReportConfig-B2-GERAN | | |
| } | | | |
| } | | | |

| Derivation Path: 36.508, Table 4.6.6-1, condition GERAN | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f11 | | |
| measObject[2] | MeasObjectGERAN-GENERIC(f11) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-GERAN | | |
| reportConfig[1] | ReportConfigInterRAT-B2-GERAN(-69, [-79]) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f11 | | |
| reportConfigId[1] | IdReportConfig-B2-GERAN | | |
| } | | | |
| quantityConfig SEQUENCE { | | | |
| quantityConfigGERAN SEQUENCE { | | | |
| measQuantityGERAN | rssi | | |
| filterCoefficient | fc0 | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------------------|
| GERAN | For inter-RAT measurements with GERAN |

Table 8.6.7.2.3.3-5: MeasObjectGERAN-GENERIC(f11) (Table 8.6.7.2.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-2A | | | |
|---|---|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectUTRA-GENERIC(Freq) ::= SEQUENCE { | | | |
| carrierFreq | Same downlink ARFCN as used for Cell 24 | | |
| offsetFreq | 0 (dB 0) | | |
| cellsToRemoveList | Not present | | |
| cellsToAddModList | Not present | For UTRA, the neighbouring cell list needs to be provided in specific test cases. | |
| cellForWhichToReportCGI | Not present | | |
| } | | | |

Table 8.6.7.2.3.3-6: *MeasurementReport* (step 4, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 2 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListGERAN SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 24 | | |
| } | | | |
| } | | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rssi | (0..63) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.2.3.3-7: MeasurementReport (step 6, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.2.3.3-8: RRCConnectionReconfiguration (step 7, Table 8.6.7.2.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition HO

Table 8.6.7.2.3.3-9: MobilityControlInfo (Table 8.6.7.2.3.3-8)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.7.2.3.3-10: RRCConnectionReestablishmentRequest (step 9, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.2.3.3-11: RRCConnectionReestablishmentComplete (step 11, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.2.3.3-12: RRCConnectionReconfiguration (step 12, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.2.3.3-13: UEInformationRequest (step 14, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.2.3.3-14: *UEInformationResponse* (step 15, Table 8.6.7.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListGERAN--r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink ARFCN as used for Cell 24 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | Physical cell Identity of Cell 24 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rssi | (0..63) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultList UTRA-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |

| | | | |
|--------------------------------------|--|--|--|
| cellId | <i>cellId</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 2 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellId | <i>cellId</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| timeConnFailure-r10 | Any allowed value | | |
| connectionFailureType-r10 | hof | | |
| previousPCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellId | <i>cellId</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.7.3 Handover Failure logging / Reporting of CDMA2000 Inter-RAT measurements

8.6.7.3.1 Test Purpose (TP)

(1)

```

with { UE in RRC_CONNECTED having performed the CDMA2000 measurement and reported that the UE has
handover failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for CDMA
neighbour cell
  }
}

```

8.6.7.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.5.6, 5.3.7.4, 5.3.7.5 and 5.6.5.3.

[TS 36.331, clause 5.3.5.6(TP1)]

The UE shall:

- 1> if T304 expires (handover failure):

NOTE: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE any more.

- 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;
- 2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-Identity* to the RPLMN;
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected handover failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof';
- 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 2: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

[TS 36.331, clause 5.3.7.4(TP1)]

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

- 1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

The UE shall set the contents of *RRCCConnectionReestablishmentRequest* message as follows:

...

1> set the *reestablishmentCause* as follows:

...

2> else if the re-establishment procedure was initiated due to handover failure as specified in 5.3.5.6 (intra-LTE handover failure) or 5.4.3.5 (inter-RAT mobility from EUTRA failure):

3> set the *reestablishmentCause* to the value *handoverFailure*;

...

[TS 36.331, clause 5.3.7.5(TP1)]

The UE shall:

...

1> set the content of *RRCCConnectionReestablishmentComplete* message as follows:

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN:

3> include the *rlf-InfoAvailable*;

...

1> submit the *RRCCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.6.5.3(TP1)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and *plmn-Identity* stored in *VarRLF-Report* is equal to the RPLMN, set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

1> if the *rlf-Report* is included in *UEInformationResponse*:

2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers.

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.7.3.3 Test description

8.6.7.3.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 2 and Cell 15- Cell 1 and Cell 2 are E-UTRAN cell, Cell 15 is a HRPD cell.
- All cells belong to the same PLMN.

- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.7.3.3.2 Test procedure sequence

Table 8.6.7.3.3.2-1 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", "T2" and "T3" are to be applied subsequently. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.7.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Cell 15 | Remark |
|----|-----------------------|--------------|--------|--------|---------|---|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | -60 | - | The power level values are such that entering conditions for event A3 and event B2 are not satisfied. |
| | Ior/loc | dB | - | - | -20 | |
| | loc | dBm/1.23 MHz | - | - | -55 | |
| | Pilot Ec/Io (NOTE 1) | dB | - | - | -20 | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -80 | -80 | - | The power level values are such that entering conditions for event B2 are satisfied. |
| | Ior/loc | dB | - | - | -5 | |
| | loc | dBm/1.23 MHz | - | - | -55 | |
| | Pilot Ec/Io (NOTE 1) | dB | - | - | -6 | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | -80 | -74 | - | The power level values are such that entering conditions for event A3 are satisfied. |
| | Ior/loc | dB | - | - | "Off" | |
| | loc | dBm/1.23 MHz | - | - | "Off" | |
| | Pilot Ec/Io (NOTE 1) | dB | - | - | "Off" | |
| T3 | Cell-specific RS EPRE | dBm/15kHz | "Off" | -74 | - | Only Cell 2 is available. (NOTE 2) |
| | Ior/loc | dB | - | - | "Off" | |
| | loc | dBm/1.23 MHz | - | - | "Off" | |
| | Pilot Ec/Io (NOTE 1) | dB | - | - | "Off" | |

NOTE 1: This parameter is not directly settable, but is derived by calculation from the other parameters set by the SS.
NOTE 2: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1.

Table 8.6.7.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1, Cell 2 and Cell 15 parameters according to the row "T1" in Table 8.6.7.3.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 2 and Cell 15 parameters according to the row "T2" in Table 8.6.7.3.3.2-1. | - | - | - | - |
| 6 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 7 | The SS transmits an <i>RRCConnectionReconfiguration</i> message including <i>mobilityControlInfo</i> on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| - | EXCEPTION: In parallel to the events described in step 8 the steps specified in Table 8.6.7.3.3.2-3 should take place. | - | - | - | - |
| 8 | The SS changes Cell 1 parameter according to the row "T3" in Table 8.6.7.3.3.2-1. | - | - | - | - |
| 9 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 10 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 11 | The UE transmits an <i>RRCConnectionReestablishmentComplete</i> message with handover failure information on Cell 2. | --> | <i>RRCConnectionReestablishmentComplete</i> | - | - |
| 12 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 13 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 14 | The SS transmits a <i>UEInformationRequest</i> message on Cell 2. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE transmit a <i>UEInformationResponse</i> message on Cell 2? | --> | <i>UEInformationResponse</i> | 1 | P |
| 16 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 2? | - | - | 1 | - |

Table 8.6.7.3.3.2-3: Parallel behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|---------|----|---------|
| | | U - S | Message | | |
| - | EXCEPTION: The steps 1 and 2 below are repeated for the duration of T304. | - | - | - | - |
| 1 | The UE attempts to perform handover using MAC Random Access Preamble on Cell 2. | - | - | - | - |
| 2 | The SS does not respond. | - | - | - | - |

8.6.7.3.3.3 Specific message contents

Table 8.6.7.3.3.3-1: SystemInformationBlockType2 for Cell 2 (preamble and all steps, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType2 ::= SEQUENCE { | | | |
| radioResourceConfigCommon SEQUENCE { | | | |
| rach-ConfigCommon SEQUENCE { | | | |
| ra-SupervisionInfo SEQUENCE { | | | |
| preambleTransMax | n50 | | |
| } | | | |
| uplinkPowerControlCommon-v1020 | Not present | | |
| } | | | |
| } | | | |
| ssac-BarringForMMTEL-Voice-r9 | Not present | | |
| ssac-BarringForMMTEL-Video-r9 | Not present | | |
| ac-BarringForCSFB-r10 | Not present | | |
| } | | | |

Table 8.6.7.3.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS | | | |
|--|--|--|--|
|--|--|--|--|

Table 8.6.7.3.3.3-3: MeasConfig (Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.6-1 | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f14 | | |
| measObject[2] | MeasObjectCDMA2000-f14 | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 2 entries | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| reportConfigId[2] | IdReportConfig-B2-CDMA2000 | | |
| reportConfig[2] | ReportConfigInterRAT-B2-CDMA2000(-69, -18) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 2 entries | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| measId[2] | 2 | | |
| measObjectId[2] | IdMeasObject-f14 | | |
| reportConfigId[2] | IdReportConfig-B2-CDMA2000 | | |
| } | | | |
| quantityConfig | | | |
| } | | | |

Table 8.6.7.3.3.3-4: *QuantityConfig* (Table 8.6.7.3.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-3A, condition CDMA2000 | | | |
|---|---------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| QuantityConfig SEQUENCE { | | | |
| quantityConfigCDMA2000 SEQUENCE { | | | |
| measQuantityCDMA2000 | pilotStrength | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3.3-5: *MeasObjectCDMA2000-f14* (Table 8.6.7.3.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-1C | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectCDMA2000 ::= SEQUENCE { | | | |
| cdma2000-Type | typeHRPD | | |
| CarrierFreqCDMA2000 SEQUENCE { | | | |
| bandClass | Band Class of f14 | | |
| arfcn | f14 | | |
| } | | | |
| searchWindowSize | 15 | | |
| offsetFreq | 0dB | | |
| cellsToAddModList CHOICE { | | | |
| cellsToAddModListCDMA2000 SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 | | |
| } | | | |
| } | | | |
| cellForWhichToReportCGI | 50 | | |
| } | | | |

Table 8.6.7.3.3.3-6: *MeasurementReport* (step 4, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 2 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultsCDMA2000 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| preRegistrationStatusHRPD | | | |
| measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3.3-7: MeasurementReport (step 6, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3.3-8: RRCConnectionReconfiguration (step 7, Table 8.6.7.3.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition HO |
|--|

Table 8.6.7.3.3.3-9: MobilityControlInfo (Table 8.6.7.3.3.3-8)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 2 | | |
| carrierFreq | Not present | | |
| } | | | |

Table 8.6.7.3.3.3-10: RRCConnectionReestablishmentRequest (step 9, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 | | | |
| SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | handoverFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3.3-11: RRCConnectionReestablishmentComplete (step 11, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rfl-InfoAvailable-r9 | true | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3.3-12: RRCConnectionReconfiguration (step 12, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-8 | | | |
|---|---------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfiguration ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionReconfiguration-r8 SEQUENCE { | | | |
| radioResourceConfigDedicated | RadioResourceConfigDedicated-HO | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3-13: UEInformationRequest (step 14, Table 8.6.7.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationRequest-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| rif-ReportReq-r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.3.3-14: *UEInformationResponse* (step 15, Table 8.6.7.3.3-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|---|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| r1f-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink EARFCN as used for Cell 2 | | |
| measResultList-r9[1] SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | PhysicalCellIdentity of Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultsCDMA2000-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same downlink ARFCN as used for Cell 15 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| preRegistrationStatusHRPD | | | |
| } | | | |
| measResultListCDMA2000 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| measResultListGERAN-r9 | Not present | | |
| measResultListUTRA-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity, otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within | | |

| | | | |
|--------------------------------------|--|--|--|
| | <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 2 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 2 | | |
| } | | | |
| } | | | |
| reestablishmentCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 2 | | |
| } | | | |
| timeConnFailure-r10 | Any allowed value | | |
| connectionFailureType-r10 | hof | | |
| previousPCellId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.7.4 Handover Failure logging / Reporting at UTRAN Inter-RAT handover / PLMN list

8.6.7.4.1 Test Purpose (TP)

(1)

```

with { UE selects the UTRAN cell and enters UTRA CELL_DCH(PS-DCCH+DTCH_DCH) after detection of radio link failure in an E-UTRAN cell }
ensure that {
  when { UE receives a HANDOVER FROM UTRAN COMMAND message including the eutra-Message and UE selects the EPLMN which is not the RPLMN }
  then { UE transmits an RRCConnectionReconfigurationComplete message containing rlf-InfoAvailable and enters E-UTRA RRC_CONNECTED state }
}

```

(2)

```

with { UE in RRC_CONNECTED having reported that the UE has radio link failure information available }
ensure that {
  when { UE receives the UEInformationRequest message containing rlf-ReportReq }
  then { UE sends the UEInformationResponse message containing the measurement result for UTRA neighbour cell }
}

```

}

8.6.7.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.11.3, 5.4.2.3 and 5.6.5.3.

[TS 36.331, clause 5.3.11.3 (TP1, TP2)]

The UE shall:

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> if the last *RRCCONNECTIONRECONFIGURATION* message including the *mobilityControlInfo* concerned an intra E-UTRA handover:
 - 5> include the *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCCONNECTIONRECONFIGURATION* message including *mobilityControlInfo* was received;

- 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned a handover to E-UTRA from UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO:
 - 5> include the *previousUTRA-CellId* and set it to the physical cell identity, the carrier frequency and the global cell identity, if available, of the UTRA Cell in which the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to *rlf*;
- 3> set the *c-RNTI* to the C-RNTI used in the PCell;
- 3> set the *rlf-Cause* to the trigger for detecting radio link failure;
- 2> if AS security has not been activated:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 2> else:
 - 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.4.2.3 (TP1)]

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

...

- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 3> include *connEstFailInfoAvailable*;

[TS 36.331, clause 5.6.5.3 (TP2)]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

- 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

- 1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.7.4.3 Test description

8.6.7.4.3.1 Pre-test conditions

System Simulator:

- Cell 1, Cell 5 and Cell 12
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cell.

Table 8.6.7.4.3.1-1: PLMN identifiers

| Cell | PLMN name |
|------|-----------|
| 1 | PLMN1 |
| 5 | PLMN1 |
| 12 | PLMN2 |

UE:

None.

Preamble:

- The UE is registered on PLMN1 (Cell 1) using the procedure described in TS 36.508[18] clause 4.5.2.3 except that the ATTACH ACCEPT message indicates PLMN2 in the Equivalent PLMN list as described in Table 8.6.7.4.3.3-1
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.7.4.3.2 Test procedure sequence

Table 8.6.7.4.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Configurations marked "T1", "T2" and "T3" are applied at the points indicated in the Main behaviour description in Table 8.6.7.4.3.2-2. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.7.4.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Cell12 | Remark |
|--|--------------------------|--------------|--------|--------|--------|---|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -80 | - | "Off" | The power level values are such that entering conditions for event B2 are satisfied. (NOTE2) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -70 | "Off" | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -70 | "Off" | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | "Off" | - | "Off" | Only Cell 5 is available. (NOTE 1, NOTE 2) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -70 | "Off" | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -70 | "Off" | |
| T3 | Cell-specific RS EPRE | dBm/15kHz | "Off" | - | -70 | The power level values are such that entering conditions for event 3a are satisfied. (NOTE 1) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -100 | - | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -100 | - | |
| NOTE 1: Power level "Off" for E-UTRA cell is defined in TS 36.508 Table 6.2.2.1-1. | | | | | | |
| NOTE 2: Power level "Off" for UTRA cell is defined in TS 34.108 Table 6.1.4 and Table 6.1.9. | | | | | | |

Table 8.6.7.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to setup inter-RAT measurement on Cell 1. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 1. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 5 parameters according to the row "T1" in Table 8.6.7.4.3.2-1. | - | - | - | - |
| 4 | The UE transmits a <i>MeasurementReport</i> message on Cell 1. | --> | <i>MeasurementReport</i> | - | - |
| 5 | The SS changes Cell 1 parameter according to the row "T2" in Table 8.6.7.4.3.2-1. | - | - | - | - |
| 6 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 7-11 | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA PS RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs NW initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | For UTRAN FDD, EXCEPTION: Steps 12a1 to 12a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. For UTRAN TDD, goto Step 13. | - | - | - | - |
| 12a1 | IF <i>pc_UTRA_CompressedModeRequired</i> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 12a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 13 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 14 | The SS changes Cell 5 and Cell 12 parameters according to the row "T3" in Table 8.6.7.4.3.2-1. | - | - | - | - |
| 15 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 16 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 17 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message with radio link failure information on Cell 12? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 18 | Generic test procedure in TS 36.508 subclause 6.4.2.10 is performed on Cell 12. NOTE: The UE performs tracking area updating procedure without ISR and security reconfiguration after successful completion of handover from UTRA. | - | - | - | - |
| 19 | The SS transmits a <i>UEInformationRequest</i> message on Cell 12. | <-- | <i>UEInformationRequest</i> | - | - |
| 20 | Check: Does the UE transmit a | --> | <i>UEInformationResponse</i> | 2 | P |

| | | | | | |
|----|--|---|---|---|---|
| | <i>UEInformationResponse</i> message on Cell 12? | | | | |
| 21 | Check: Does the test result of generic test procedure in TS 36.508 subclause 6.4.2.3 indicate that the UE is in E-UTRA RRC_CONNECTED state on Cell 12? | - | - | 2 | - |

8.6.7.4.3.3 Specific message contents

Table 8.6.7.4.3.3-1: ATTACH ACCEPT for Cell 1 (preamble)

| Derivation path: 36.508 Table 4.7.2-1 | | | |
|---------------------------------------|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Equivalent PLMNs | PLMN2 | | |

Table 8.6.7.4.3.3-2: RRCConnectionReconfiguration (step 1, Table 8.6.7.4.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-8, condition MEAS |
|--|

Table 8.6.7.4.3.3-3: MeasConfig (Table 8.6.7.4.3.3-2)

| Derivation Path: 36.508, Table 4.6.6-1, condition UTRAN | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f8 | | |
| measObject[2] | MeasObjectUTRA-f8 | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-B2-UTRA | | |
| reportConfig[1] | ReportConfigInterRAT-B2-UTRA(-92, -82) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f8 | | |
| reportConfigId[1] | IdReportConfig-B2-UTRA | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.4.3.3-4: QuantityConfig (Table 8.6.7.4.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-3A, condition UTRAN | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| QuantityConfig ::= SEQUENCE { | | | |
| quantityConfigUTRA SEQUENCE { | | | |
| measQuantityUTRA-FDD | cpich-RSCP | | UTRA-FDD |
| measQuantityUTRA-TDD | pccpch-RSCP | | UTRA-TDD |
| filterCoefficient | fc0 | | |
| } | | | |
| quantityConfigUTRA-v1020 | Not present | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.4.3.3-5: MeasObjectUTRA-f8 (Table 8.6.7.4.3.3-3)

| Derivation Path: 36.508, Table 4.6.6-3 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectUTRA ::= SEQUENCE { | | | |
| carrierFreq | Same downlink ARFCN as used for Cell 5 | | |
| cellsToAddModList CHOICE { | | | |
| cellsToAddModListUTRA-FDD SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | UTRA-FDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 5 | | |
| } | | | |
| cellsToAddModListUTRA-TDD SEQUENCE (SIZE (1..maxCellMeas)) OF SEQUENCE { | | | UTRA-TDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | PhysicalCellIdentity of Cell 5 | | |
| } | | | |
| } | | | |
| csg-allowedReportingCells-v930 | Not present | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.4.3.3-6: MeasurementReport (step 4, Table 8.6.7.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListUTRA SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId CHOICE { | | | |
| fdd | PhysicalCellIdentity of Cell 5 | | UTRA-FDD |
| tdd | PhysicalCellIdentity of Cell 5 | | UTRA-TDD |
| } | | | |
| } | | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| utra-RSCP | (-5..91) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| locationInfo-r10 | Not present | | |
| measResultServFreqList-r10 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.7.4.3.3-7: HANDOVER FROM UTRAN COMMAND (step 16, Table 8.6.7.4.3.2-2)

Derivation Path: 36.508, Table 4.7B.1-2

Table 8.6.7.4.3.3-8: RRCConnectionReconfiguration (Table 8.6.7.4.3.3-7)

Derivation Path: 36.508, Table 4.6.1-8, condition HO-TO-EUTRA(1,0)

Table 8.6.7.4.3.3-9: *MobilityControlInfo* (Table 8.6.7.4.3.3-8)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 12. | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 12. | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| carrierBandwidth SEQUENCE { | | | |
| dl-Bandwidth | Same downlink system bandwidth as used for Cell 12 | | |
| ul-Bandwidth | Same uplink system bandwidth as used for Cell 12 | | FDD |
| ul-Bandwidth | Not present | | TDD |
| } | | | |
| additionalSpectrumEmission | 1 | | |
| } | | | |

| Condition | Explanation |
|-----------|----------------------|
| FDD | FDD cell environment |
| TDD | TDD cell environment |

Table 8.6.7.4.3.3-10: *SecurityConfigHO* (Table 8.6.7.4.3.3-8)

| Derivation Path: 36.508, Table 4.6.4-1 | | | |
|--|---|---|-----------|
| Information Element | Value/remark | Comment | Condition |
| SecurityConfigHO ::= SEQUENCE { | | | |
| handoverType CHOICE { | | | |
| interRAT SEQUENCE { | | | |
| securityAlgorithmConfig SEQUENCE { | | | |
| cipheringAlgorithm | Set according to PIXIT parameter for default ciphering protection algorithm | | |
| integrityProtAlgorithm | Set according to PIXIT parameter for default integrity algorithm | | |
| } | | | |
| nas-SecurityParamToEUTRA | Octets 1 to 4 are arbitrarily selected. Bits 1 to 3 of octet 5 are set according to PIXIT parameter for default integrity protection algorithm. Bits 5 to 7 of octet 5 are set according to PIXIT parameter for default ciphering algorithm. Bits 1 to 3 of octet 6 are arbitrarily selected between '000'B and '110'B, different from the valid NAS key set identifier of the UE if such a value exists. Bit 4 of octet 6 is set to 1. | Octets 1 to 4 include the NonceMME value. Bits 1 to 3 of octet 5 include the Type of integrity protection algorithm Bits 5 to 7 of octet 5 include the Type of ciphering algorithm. Bits 1 to 4 of octet 6 include the NAS key set identifier. | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.4.3.3-11: *RRCConnectionReconfigurationComplete* (step 17, Table 8.6.7.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-9 | | | |
|---|----------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| lateNonCriticalExtension | Not present or any allowed value | | |
| nonCriticalExtension SEQUENCE { | | | |
| rf-InfoAvailable-r10 | true | | |
| logMeasAvailable-r10 | Not present | | |
| nonCriticalExtension | Not present or any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.7.4.3.3-12: *UEInformationRequest* (step 19, Table 8.6.7.4.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition RLF report |
|--|

Table 8.6.7.4.3.3-13: *UEInformationResponse* (step 20, Table 8.6.7.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|--|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rfl-Report-r9 SEQUENCE { | | | |
| measResultLastServCell-r9 SEQUENCE { | | | |
| rsrpResult-r9 | (0..97) | | |
| rsrqResult-r9 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r9 SEQUENCE { | | | |
| measResultListEUTRA-r9 | Not present | | |
| measResultListUTRA-r9 SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE { | 1 entry | | |
| carrierFreq-r9 | Same downlink ARFCN as used for Cell 5 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId CHOICE { | | | |
| fdd | PhysicalCellIdentity of Cell 5 | | UTRA-FDD |
| tdd | PhysicalCellIdentity of Cell 5 | | UTRA-TDD |
| } | | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| utra-RSCP | Not present or (-5..91) | | |
| utra-EcN0 | Not present | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListGERAN-r9 | Not present | | |
| measResultsCDMA2000-r9 | Not present | | |
| } | | | |
| locationInfo-r10 | Not present or any allowed value | | |
| failedPCellId-r10 CHOICE { | cellGlobalId-r10 or pci-arfcn-r10 | If the UE has the global cell identity depending on UE implementation, the UE sets the global cell identity; otherwise the UE sets the physical cell identity and the carrier frequency. | |
| cellGlobalId-r10 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| pci-arfcn-r10 SEQUENCE { | | | |
| physCellId-r10 | Physical cell Identity of Cell 1 | | |
| carrierFreq-r10 | Same downlink EARFCN as used for Cell 1 | | |
| } | | | |

| | | | |
|---------------------------|-------------------|--|--|
| } | | | |
| reestablishmentCellId-r10 | Not present | | |
| timeConnFailure-r10 | Not present | | |
| connectionFailureType-r10 | r1f | | |
| previousPCellId-r10 | Not present | | |
| basicFields-r11SEQUENCE { | | | |
| c-RNTI-r11 | Any allowed value | | |
| r1f-Cause-r11 | t310-Expiry | | |
| timeSinceFailure-r11 | Any allowed value | | |
| } | | | |
| previousUTRA-CellId-r11 | Not present | | |
| selectedUTRA-CellId-r11 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

8.6.8 Connection Establishment Failure

8.6.8.1 Connection Establishment Failure logging / Logging and reporting / T300 expiry

8.6.8.1.1 Test Purpose (TP)

(1)

```
with { UE having sent an RRCConnectionRequest message }
ensure that {
  when { T300 is expired }
  then { UE stores the connection establishment failure information }
}
```

(2)

```
with { UE having sent an RRCConnectionSetupComplete message with connEstFailInfoAvailable }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
  then { UE sends a UEInformationResponse message with connEstFailReport }
}
```

8.6.8.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4 and 5.3.3.6.

[TS 36.331, clause 5.3.3.4]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable*;

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
 - 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
 - 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
 - 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

8.6.8.1.3 Test description

8.6.8.1.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.8.1.3.2 Test procedure sequence

Table 8.6.8.1.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|-----------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>Paging</i> message. | <-- | <i>Paging</i> | - | - |
| 2 | The UE transmits an <i>RRCCONNECTIONREQUEST</i> message. | --> | <i>RRCCONNECTIONREQUEST</i> | - | - |
| 3 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCCONNECTIONREQUEST</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 4 | The SS transmits a <i>Paging</i> message. | <-- | <i>Paging</i> | - | - |
| 5 | The UE transmits an <i>RRCCONNECTIONREQUEST</i> message. | --> | <i>RRCCONNECTIONREQUEST</i> | - | - |
| 6 | The SS transmits an <i>RRCCONNECTIONSETUP</i> message. | <-- | <i>RRCCONNECTIONSETUP</i> | - | - |
| 7 | Check: Does the UE transmit an <i>RRCCONNECTIONSETUPCOMPLETE</i> message including <i>connEstFailInfoAvailable</i> IE set it to <i>true</i> ? | --> | <i>RRCCONNECTIONSETUPCOMPLETE</i> | 1 | P |
| 8-11 | Steps 6 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 12 | The SS sends a <i>UEINFORMATIONREQUEST</i> message to get <i>connEstFailReportReq</i> . | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 13 | Check: Does the UE send a <i>UEINFORMATIONRESPONSE</i> message with <i>connEstFailReport</i> ? | --> | <i>UEINFORMATIONRESPONSE</i> | 2 | P |

8.6.8.1.3.3 Specific message contents

Table 8.6.8.1.3.3-1: *RRCCONNECTIONSETUPCOMPLETE* (step 7, Table 8.6.8.1.3.2-1)

| Derivation Path: TS 36.508 Table 4.6.1-18 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCCONNECTIONSETUPCOMPLETE</i> ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>rrcConnectionSetupComplete-r8</i> SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| <i>connEstFailInfoAvailable-r11</i> | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Table 8.6.8.1.3.3-2: *UEINFORMATIONREQUEST* (step 12, Table 8.6.8.1.3.2-1)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition ConEstFail |
|--|

Table 8.6.8.1.3.3-3: *UEInformationResponse* (step 13, Table 8.6.8.1.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 | Not present | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.8.2 Connection Establishment Failure logging / Logging and reporting / Reporting at intra-LTE handover

8.6.8.2.1 Test Purpose (TP)

(1)

```
with { UE has connection establishment failure information available }
ensure that {
  when { UE performs an Handover procedure }
  then { UE sends an RRConnectionReconfigurationComplete message with connEstFailInfoAvailable }
}
```

8.6.8.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6 and 5.3.5.4.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.3.5.4]

If the *RRCCONNECTIONRECONFIGURATION* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

...

- 1> set the content of *RRCCONNECTIONRECONFIGURATIONCOMPLETE* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 3> include the *logMeasAvailable*;

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable*;

8.6.8.2.3 Test description

8.6.8.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 3
- System information combination 3 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.8.2.3.2 Test procedure sequence

Table 8.6.8.2.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.8.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Remark |
|----|-----------------------|------------|--------|--------|--------|
| T0 | Cell-specific RS EPRE | dBm/15 kHz | -85 | -97 | |
| T1 | Cell-specific RS EPRE | dBm/15 kHz | -85 | -73 | |

Table 8.6.8.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>Paging</i> message. | <-- | <i>Paging</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionRequest</i> message. | --> | <i>RRCConnectionRequest</i> | - | - |
| 3 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | | - | - |
| 4 | SS sends a <i>Paging</i> message to the UE on the appropriate paging block, and including the UE identity in one entry of the IE <i>pagingRecordLists</i> . | <-- | RRC: <i>Paging</i> (PCCH) | - | - |
| 5 | UE transmits an <i>RRCConnectionRequest</i> message. | --> | RRC: <i>RRCConnectionRequest</i> | - | - |
| 6 | SS transmit an <i>RRCConnectionSetup</i> message. | <-- | RRC: <i>RRCConnectionSetup</i> | - | - |
| 7 | The UE transmits an <i>RRCConnectionSetupComplete</i> message to confirm the successful completion of the connection establishment and to initiate the session management procedure by including the SERVICE REQUEST message. (State3) | --> | RRC: <i>RRCConnectionSetupComplete</i> NAS: SERVICE REQUEST | - | - |
| 8-11 | Steps 6 to 9 the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | | - | - |
| 12 | The SS transmits a <i>RRCConnectionReconfiguration</i> message | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 13 | The UE transmits a <i>RRCConnectionReconfigurationComplete</i> message | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |
| 14 | The SS changes cell 1 and cell 3 parameters according to the row "T1" in table 8.6.8.2.3.2-1 | - | | - | - |
| 15 | The UE transmits a <i>MeasurementReport</i> message. | --> | <i>MeasurementReport</i> | - | - |
| 16 | The SS transmits an <i>RRCConnectionReconfiguration</i> message to order the UE to perform handover to Cell 3. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 17 | The UE transmit an <i>RRCConnectionReconfigurationComplete</i> message containing <i>connEstFaillInfoAvailable</i> to Cell 3. | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |

8.6.8.2.3.3 Specific message contents

Table 8.6.8.2.3.3-1: RRCConnectionSetupComplete (step 7, Table 8.6.8.2.3.2-1)

| Derivation Path: TS 36.508 Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.2.3.3-2 : RRCConnectionReconfiguration (step 12, Table 8.6.8.2.3.2-2)

| |
|---|
| Derivation Path: 36.508 clause 4.6.1-8 Condition MEAS |
|---|

Table 8.6.8.2.3.3-3: MeasConfig (Table 8.6.8.2.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition INTER-FREQ | | | |
|---|-----------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE { | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f2 | | |
| measObject[2] | MeasObjectEUTRA-GENERIC(f2) | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE { | 1 entry | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| reportConfig[1] | ReportConfigEUTRA-A3 | | |
| } | | | |
| measIdToAddModListSEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | |
| measId[1] | 1 | | |
| measObjectId[1] | IdMeasObject-f2 | | |
| reportConfigId[1] | IdReportConfig-A3 | | |
| } | | | |
| } | | | |

Table 8.6.8.2.3.3-4: MeasurementReport (step 15, Table 8.6.8.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|--------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultServCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE { | | | |
| measResultListEUTRASEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId | PhysicalCellIdentity of Cell 3 | | |
| cgi-Info | Not present | | |
| measResult SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultForECID-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.2.3.3-5: RRCConnectionReconfiguration (step 16, Table 8.6.8.2.3.2-2)

| |
|--|
| Derivation Path: 36.508 Table 4.6.1-8 Condition HO |
|--|

Table 8.6.8.2.3.3-6: MobilityControlInfo (Table 8.6.8.2.3.3-4)

| Derivation Path: 36.508, Table 4.6.5-1 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MobilityControlInfo ::= SEQUENCE { | | | |
| targetPhysCellId | PhysicalCellIdentity of Cell 3 | | |
| carrierFreq SEQUENCE { | | | |
| dl-CarrierFreq | Same downlink EARFCN as used for Cell 3 | | |
| ul-CarrierFreq | Not present | | |
| } | | | |
| } | | | |

Table 8.6.8.2.3.3-7: *RRCConnectionReconfigurationComplete* (step 17, Table 8.6.8.2.3.2-2)

| Derivation Path: 36.331 clause 6.2.2 | | | |
|---|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-UL | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-v1130-IEs | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| } | | | |
| } | | | |
| } | | | |

8.6.8.3 Connection Establishment Failure logging / Logging and reporting / Reporting at RRC connection re-establishment

8.6.8.3.1 Test Purpose (TP)

(1)

```
with { UE has connection establishment failure information available }
ensure that {
  when { UE performs an RRC Connection re-establishment procedure }
  then { UE sends an RRCConnectionReestablishmentComplete message with connEstFailInfoAvailable }
}
```

8.6.8.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6 and .5.3.7.5.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.3.7.5]

NOTE 1: Prior to this, lower layer signalling is used to allocate a C-RNTI. For further details see TS 36.321 [6];

The UE shall:

...

- 1> set the content of *RRCConnectionReestablishmentComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 3> include the *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 3> include the *connEstFailInfoAvailable*;
- 1> perform the measurement related actions as specified in 5.5.6.1;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission, upon which the procedure ends;

8.6.8.3.3 Test description

8.6.8.3.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].
- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

8.6.8.3.3.2 Test procedure sequence

Table 8.6.8.3.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.8.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Remark |
|----|-----------------------|------------|--------|--------|-------------------------------------|
| T0 | Cell-specific RS EPRE | dBm/15 kHz | -80 | "Off" | Only Cell 1 is available. (NOTE 1). |
| T1 | Cell-specific RS EPRE | dBm/15 kHz | "Off" | -80 | Only Cell 2 is available. (NOTE 1). |

NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1.

Table 8.6.8.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 3 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 4-11 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 12 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.8.3.3.2-1. | - | - | - | - |
| 13 | The UE transmits an <i>RRCConnectionReestablishmentRequest</i> message on Cell 2. | --> | <i>RRCConnectionReestablishmentRequest</i> | - | - |
| 14 | The SS transmits an <i>RRCConnectionReestablishment</i> message on Cell 2. | <-- | <i>RRCConnectionReestablishment</i> | - | - |
| 15 | Check: Does the UE send an <i>RRCConnectionReestablishmentComplete</i> message with <i>connEstFailInfoAvailable</i> on Cell 2? | --> | <i>RRCConnectionReestablishmentComplete</i> | 1 | P |
| 16 | The SS transmits an <i>RRCConnectionReconfiguration</i> message on Cell 2. | <-- | <i>RRCConnectionReconfiguration</i> | - | - |
| 17 | The UE transmits an <i>RRCConnectionReconfigurationComplete</i> message on Cell 2. | --> | <i>RRCConnectionReconfigurationComplete</i> | - | - |

8.6.8.3.3.3 Specific message contents

Table 8.6.8.3.3.3-1: RRCConnectionSetupComplete (step 7, Table 8.6.8.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.3.3.3-2: RRCConnectionReestablishmentRequest (step 13, Table 8.6.8.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-13 | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentRequest ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentRequest-r8 SEQUENCE { | | | |
| ue-Identity SEQUENCE { | | | |
| c-RNTI | the value of the C-RNTI of the UE | | |
| physCellId | PhysicalCellIdentity of Cell 1 | | |
| shortMAC-I | The same value as the 16 least significant bits of the XMAC-I value calculated by SS | | |
| } | | | |
| reestablishmentCause | otherFailure | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.3.3-3: *RRCConnectionReestablishmentComplete* (step 15, Table 8.6.8.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-11 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReestablishmentComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReestablishmentComplete-r8 = SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| rlf-InfoAvailable-r9 | true | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.8.4 Connection Establishment Failure logging / Logging and reporting / Location Information

8.6.8.4.1 Test Purpose (TP)

(1)

```

with { UE has connection establishment failure information available with location information }
ensure that {
  when { UE receives the UEInformationRequest message containing connEstFailReportReq }
  then { UE sends the UEInformationResponse message containing connEstFailReport with
  locationCoordinates }
}

```

8.6.8.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.306, clause 4.3.13.2; TS 36.331, clauses 5.3.3.6 and 5.6.5.3.

[TS 36.306, clause 4.3.13.2]

This parameter defines whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements in RRC_IDLE.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;

- 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
- 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.8.4.3 Test description

8.6.8.4.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None.

Preamble:

- 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 36.509 [25] , if supported by the UE according to pc_UpdateUE_LocationInformation. Otherwise, or in addition any other suitable method may also be used.
- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.8.4.3.2 Test procedure sequence

Table 8.6.8.4.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>Paging</i> message. | <-- | <i>Paging</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionRequest</i> message. | --> | <i>RRCConnectionRequest</i> | - | - |
| 3 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 4-11 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure. | - | - | - | - |
| 12 | The SS sends a <i>UEInformationRequest</i> message to get <i>connEstFailReportReq</i> . | <-- | <i>UEInformationRequest</i> | - | - |
| 13 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>connEstFailReport</i> with the IE <i>locationInfo-r11</i> is present? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.8.4.3.3 Specific message contents

Table 8.6.8.4.3.3-1: RRCConnectionSetupComplete (step 7, Table 8.6.8.4.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.4.3.3-2: UEInformationRequest (step 12, Table 8.6.8.4.3.2-1)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition ConEstFail |
|--|

Table 8.6.8.4.3.3-3: *UEInformationResponse* (step 13, Table 8.6.8.4.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | <i>plmn-Identity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | <i>cellIdentity</i> within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| locationInfo-r11 SEQUENCE { | | | |
| locationCoordinates-r10 CHOICE { | | | |
| ellipsoid-Point-r10 | Any allowed value | | |
| ellipsoidPointWithAltitude-r10 | Any allowed value | | |
| ellipsoidPointWithUncertaintyCircle-r11 | Any allowed value | | |
| ellipsoidPointWithAltitudeAndUncertaintyEllipsoid-r11 | Any allowed value | | |
| ellipsoidArc-r11 | Any allowed value | | |
| polygon-r11 | Any allowed value | | |
| } | | | |
| horizontalVelocity-r10 | Any allowed value | | |
| gnss-TOD-msec-r10 | Any allowed value | | |
| } | | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 | Not present | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.8.5 Connection Establishment Failure logging / Logging and reporting / Reporting of Intra-frequency measurements

8.6.8.5.1 Test Purpose (TP)

(1)

```
with { UE has connection establishment failure information available with the intra-frequency measurement result }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
```



```

    then { UE sends a UEInformationResponse message containing the measurement result for intra-
frequency neighbouring cell }
}

```

8.6.8.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6 and 5.6.5.3.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
 - 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
 - 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
 - 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;
 - 2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.8.5.3 Test description

8.6.8.5.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 2

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].
- System information combination 2 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

8.6.8.5.3.2 Test procedure sequence

Table 8.6.8.5.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.8.5.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 2 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15 kHz | -85 | "Off" | Only Cell 1 is available. (NOTE 1). |
| T1 | Cell-specific RS EPRE | dBm/15 kHz | -85 | -91 | The power level values are assigned to satisfy $R_{\text{Cell 1}} > R_{\text{Cell 2}}$. |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.8.5.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.8.5.3.2-1. | - | - | - | - |
| 2 | The SS waits for 40s to ensure that the UE detects intra-frequency cell. | - | - | - | - |
| 3 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 4 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 5 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 6-13 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 14 | The SS sends a <i>UEInformationRequest</i> message to get <i>connEstFailReportReq</i> on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>connEstFailReport</i> on Cell 1? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.8.5.3.3 Specific message contents

Table 8.6.8.5.3.3-1: *RRCConnectionSetupComplete* (step 9, Table 8.6.8.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCConnectionSetupComplete</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>rrcConnectionSetupComplete-r8</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>connEstFailInfoAvailable-r11</i> | true | | |
| <i>nonCriticalExtension</i> SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.5.3.3-2: *UEInformationRequest* (step 14, Table 8.6.8.5.3.2-2)

| |
|---|
| Derivation Path: 36.508, Table 4.6.1-23A, condition <i>ConEstFail</i> |
|---|

Table 8.6.8.5.3.3-3: *UEInformationResponse* (step 15, Table 8.6.8.5.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 SEQUENCE { | | | |
| measResultListEUTRA-r11 SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 2 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | Same as Cell 2 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | Not present or (0..97) | | |
| rsrqResult | Not present or (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r11 | Not present | | |
| measResultListGERAN-r11 | Not present | | |
| measResultsCDMA2000-r11 | Not present | | |
| } | | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.8.6 Connection Establishment Failure logging / Logging and reporting / Reporting of Inter-frequency measurements

8.6.8.6.1 Test Purpose (TP)

(1)

```

with { UE has connection establishment failure information available with the inter-frequency
measurement result }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
  then { UE sends a UEInformationResponse message containing the measurement result for inter-
frequency neighbouring cell }
}

```

8.6.8.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6 and 5.6.5.3.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];

2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;
 - 2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

- 1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.8.6.3 Test description

8.6.8.6.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 3

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

8.6.8.6.3.2 Test procedure sequence

Table 8.6.8.6.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.8.6.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 3 | Remark |
|--|-----------------------|------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15 kHz | -85 | "Off" | Only Cell 1 is available. (NOTE 1). |
| T1 | Cell-specific RS EPRE | dBm/15 kHz | -85 | -97 | The power level values are assigned to satisfy $R_{Cell\ 1} > R_{Cell\ 3}$. |
| NOTE 1: Power level "Off" is defined in TS 36.508 Table 6.2.2.1-1. | | | | | |

Table 8.6.8.6.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.8.6.3.2-1. | - | - | - | - |
| 2 | The SS waits for 40s to ensure that the UE detects inter-frequency cell. | - | - | - | - |
| 3 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 4 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 5 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 6-13 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 14 | The SS sends a <i>UEInformationRequest</i> message to get <i>connEstFailReportReq</i> on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>connEstFailReport</i> on Cell 1? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.8.6.3.3 Specific message contents

Table 8.6.8.6.3.3-1: *RRCConnectionSetupComplete* (step 9, Table 8.6.8.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCConnectionSetupComplete</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>rrcConnectionSetupComplete-r8</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>connEstFailInfoAvailable-r11</i> | true | | |
| <i>nonCriticalExtension</i> SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.8.6.3.3-2: *UEInformationRequest* (step 14, Table 8.6.8.6.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition ConEstFail |
|--|

Table 8.6.8.6.3.3-3: *UEInformationResponse* (step 15, Table 8.6.8.6.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 SEQUENCE { | | | |
| measResultListEUTRA-r11 SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 3 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | Same as Cell 3 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rsrpResult | Not present or (0..97) | | |
| rsrqResult | Not present or (0..34) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| measResultListUTRA-r11 | Not present | | |
| measResultListGERAN-r11 | Not present | | |
| measResultsCDMA2000-r11 | Not present | | |
| } | | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.9 Inter-RAT Connection Establishment Failure

8.6.9.1 Connection Establishment Failure logging / Logging and reporting / Reporting at UTRAN Inter-RAT handover

8.6.9.1.1 Test Purpose (TP)

(1)

```
with { UE has connection establishment failure information available }
ensure that {
  when { UE performs an RRC Connection reconfiguration procedure at UTRAN Inter-RAT handover }
  then { UE sends an RRCConnectionReconfigurationComplete message with connEstFailInfoAvailable }
}
```

(2)

```
with { UE having sent an RRCConnectionReconfigurationComplete message with connEstFailInfoAvailable }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
  then { UE sends a UEInformationResponse message with connEstFailReport }
}
```

8.6.9.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6 and .5.4.2.3.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;

- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.4.2.3]

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

...

- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 3> include *connEstFailInfoAvailable*;
- 1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;

...

8.6.9.1.3 Test description

8.6.9.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.9.1.3.2 Test procedure sequence

Table 8.6.9.1.3.2-1 illustrates the downlink power levels and other changing parameters to be applied for the cells at various time instants of the test execution. Subsequent configurations marked "T1" and "T2" are applied at the points indicated in the Main behaviour description in Table 8.6.9.1.3.2-2.

Table 8.6.9.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Remark |
|----|--------------------------|--------------|--------|--------|---|
| T1 | Cell-specific RS EPRE | dBm/15kHz | -90 | - | The power level values are assigned to satisfy $\text{Thresh}_{x,\text{high}} < \text{Srxlev}_{\text{cell } 5}$. |
| | CPICH Ec (UTRA FDD) | dBm/3.84 MHz | - | -65 | |
| | PCCPCH Ec(UTRA LCR TDD) | dBm/1.28 MHz | - | -65 | |
| T2 | Cell-specific RS EPRE | dBm/15kHz | -70 | - | The power level values are such that entering conditions for event 3a are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84 MHz | - | -85 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -85 | |

Table 8.6.9.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|---|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 2 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 3 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 4 | The SS changes Cell 1 and Cell 5 level according to the row "T1" in table 8.6.9.1.3.2-1. | - | - | - | - |
| 5 | Generic test procedure in TS 36.508 subclause 6.4.2.8 is performed on Cell 5. NOTE: The UE performs an RAU procedure and the RRC connection is released. | - | - | - | - |
| 6-10 | Step 7 to 11 of test procedure in TS 34.123-1 subclause 12.9.14.4 is performed on Cell 5 using the UTRA reference radio bearer parameters and combination "UTRA HSDPA RB" according to TS 36.508 subclause 4.8.3 and Table 4.8.3-1. NOTE: The UE performs Network initiated RAB re-establishment in a UTRAN cell. | - | - | - | - |
| - | UTRAN FDD: EXCEPTION: Steps 11a1 to 11a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported. UTRAN TDD : go to step 12 | - | - | - | - |
| 11a1 | IF <i>pc_UTRA_CompressedModeRequired</i> THEN the SS transmits a PHYSICAL CHANNEL RECONFIGURATION message on Cell 5 including the DPCH compressed mode info. | <-- | PHYSICAL CHANNEL RECONFIGURATION | - | - |
| 11a2 | The UE transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on Cell 5. | --> | PHYSICAL CHANNEL RECONFIGURATION COMPLETE | - | - |
| 12 | The SS transmits a MEASUREMENT CONTROL message to setup inter-RAT measurement on Cell 5. | <-- | MEASUREMENT CONTROL | - | - |
| 13 | The SS changes Cell 1 and Cell 5 level according to the row "T2" in table 8.6.9.1.3.2-1. | - | - | - | - |
| 14 | The UE transmits a MEASUREMENT REPORT message on Cell 5 including the E-UTRA event results. | --> | MEASUREMENT REPORT | - | - |
| 15 | The SS transmits a HANDOVER FROM UTRAN COMMAND message on Cell 5. | <-- | HANDOVER FROM UTRAN COMMAND | - | - |
| 16 | Check: Does the UE transmit an <i>RRCConnectionReconfigurationComplete</i> message with <i>connEstFailInfoAvailable</i> on Cell 1 using the security key derived from the new KeNB? | --> | <i>RRCConnectionReconfigurationComplete</i> | 1 | P |
| 17 | Generic test procedure in TS 36.508 subclause 6.4.2.10 is performed on Cell 1. NOTE: The UE performs tracking area updating procedure without ISR and security reconfiguration after successful completion of handover from UTRA. | - | - | - | - |
| 18 | The SS transmits a <i>UEInformationRequest</i> message to get <i>connEstFailReportReq</i> on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 19 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with <i>connEstFailReport</i> on Cell 1? | --> | <i>UEInformationResponse</i> | 2 | P |

8.6.9.1.3.3 Specific message contents

Table 8.6.9.1.3.3-1: SystemInformationBlockType6 for Cell 1 (preamble, Table 8.6.9.1.3.2-2)

| Derivation Path: 36.508, Table 4.4.3.3-5 | | | |
|--|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| SystemInformationBlockType6 ::= SEQUENCE { | | | |
| carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE { | | | UTRA-FDD |
| carrierFreq[n] | Same downlink UARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[n] | 0 | | |
| } | | | |
| carrierFreqListUTRA-TDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE { | | | UTRA-TDD |
| carrierFreq[n] | Same downlink UARFCN as used for Cell 5 | | |
| cellReselectionPriority[n] | 5 | | |
| p-MaxUTRA[n] | 0 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.9.1.3.3-2: RRCConnectionSetupComplete (step 7, Table 8.6.9.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.9.1.3.3-3: RRCConnectionReconfigurationComplete (step 24, Table 8.6.9.1.3.2-2)

| Derivation Path: 36.508 clause 4.6.1-9 | | | |
|---|------------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionReconfigurationComplete ::= SEQUENCE { | | | |
| rrc-TransactionIdentifier | RRC-TransactionIdentifier-UL | | |
| criticalExtensions CHOICE { | | | |
| rrcConnectionReconfigurationComplete-r8 | | | |
| SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.9.1.3.3-4: UEInformationRequest (step 26, Table 8.6.9.1.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition ConEstFail |
|--|

Table 8.6.9.1.3.3-5: *UEInformationResponse* (step 27, Table 8.6.9.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationResponse</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| <i>ueInformationResponse</i> -r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 | Not present | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.9.2 Connection Establishment Failure logging / Logging and reporting / Reporting of UTRAN Inter-RAT measurements

8.6.9.2.1 Test Purpose (TP)

(1)

```

with { UE has connection establishment failure information available with the UTRA measurement result }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
  then { UE sends a UEInformationResponse message containing the measurement result for UTRA neighbouring cell }
}

```

8.6.9.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6 and 5.6.5.3.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;
 - 2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.9.2.3 Test description

8.6.9.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 5
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.9.2.3.2 Test procedure sequence

Table 8.6.9.2.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.9.2.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 5 | Remark |
|--|--------------------------|--------------|--------|--------|---------------------------------------|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | - | Only Cell 1 is available. (NOTE 1) |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | "Off" | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | "Off" | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | - | Cell 1 and Cell 5 are available. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -90 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -92 | |
| NOTE 1: Power level "Off" for UTRA cell is defined in TS 34.108 Table 6.1.4 and Table 6.1.9. | | | | | |

Table 8.6.9.2.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.9.2.3.2-1. | - | - | - | - |
| 2 | The SS waits for [30s] to ensure that the UE detects UTRA cell. | - | - | - | - |
| 3 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 4 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 5 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 6-13 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 14 | The SS sends a <i>UEInformationRequest</i> message to get <i>connEstFailReportReq</i> on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>connEstFailReport</i> on Cell 1? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.9.2.3.3 Specific message contents

Table 8.6.9.2.3.3-1: *RRCConnectionSetupComplete* (step 9, Table 8.6.9.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>RRCConnectionSetupComplete</i> ::= SEQUENCE { | | | |
| <i>criticalExtensions</i> CHOICE { | | | |
| c1 CHOICE{ | | | |
| <i>rrcConnectionSetupComplete-r8</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>nonCriticalExtension</i> SEQUENCE { | | | |
| <i>connEstFailInfoAvailable-r11</i> | true | | |
| <i>nonCriticalExtension</i> SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.9.2.3.3-2: *UEInformationRequest* (step 14, Table 8.6.9.2.3.2-2)

| |
|---|
| Derivation Path: 36.508, Table 4.6.1-23A, condition <i>ConEstFail</i> |
|---|

Table 8.6.9.2.3.3-3: *UEInformationResponse* (step 15, Table 8.6.9.2.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within <i>SystemInformationBlockType1</i> broadcasted in Cell 1 | | |
| } | | | |
| } | | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 SEQUENCE { | | | |
| measResultListEUTRA-r11 | Not present | | |
| measResultListUTRA-r11 SEQUENCE { | 1 entry | | |
| carrierFreq-r9[1] | Same as Cell 5 | | |
| measResultList-r9 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | 1 entry | | |
| physCellId[1] | Same as Cell 5 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| utra-RSCP | Not present or (-5..91) | | |
| utra-EcN0 | Not present or (0..49) | | |
| additionalSI-Info-r9 | Not present | | |
| } | | | |
| } | | | |
| measResultListGERAN-r11 | Not present | | |
| measResultsCDMA2000-r11 | Not present | | |
| } | | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.9.3 Connection Establishment Failure logging / Logging and reporting / Reporting of GERAN Inter-RAT measurements

8.6.9.3.1 Test Purpose (TP)

(1)

```

with { UE has connection establishment failure information available with the GERAN measurement
result }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
  then { UE sends a UEInformationResponse message containing the measurement result for GERAN
neighbouring cell }
}

```

8.6.9.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.6. Unless otherwise stated these are Rel-11 requirements.

[TS 36.331, clause 5.3.3.6]

The UE shall:

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];

2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

8.6.9.3.3 Test description

8.6.9.3.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 24.
- System information combination 5 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.9.3.3.2 Test procedure sequence

Table 8.6.9.3.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.9.3.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 24 | Remark |
|----|-----------------------|-----------|--------|---------|---------------------------------------|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -85 | - | Only Cell 1 is available. (NOTE 1) |
| | RSSI | dBm | - | "Off" | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -85 | - | Cell 1 and Cell 24 are available. |
| | RSSI | dBm | - | -85 | |

NOTE 1: Power level "Off" for GERAN cell is defined in TS 36.508 Table 6.2.2.1-1.

Table 8.6.9.3.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 1 parameter according to the row "T1" in Table 8.6.9.3.3.2-1. | - | - | - | - |
| 2 | The SS waits for [30s] to ensure that the UE detects GERAN cell. | - | - | - | - |
| 3 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 4 | The UE transmits an <i>RRCConnectionRequest</i> message on Cell 1. | --> | <i>RRCConnectionRequest</i> | - | - |
| 5 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCConnectionRequest</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 6-13 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | - | - |
| 14 | The SS sends a <i>UEInformationRequest</i> message to get <i>connEstFailReportReq</i> on Cell 1. | <-- | <i>UEInformationRequest</i> | - | - |
| 15 | Check: Does the UE send a <i>UEInformationResponse</i> message with <i>connEstFailReport</i> on Cell 1? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.9.3.3.3 Specific message contents

Table 8.6.9.3.3.3-1: RRCConnectionSetupComplete (step 9, Table 8.6.9.3.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.9.3.3.3-2: UEInformationRequest (step 14, Table 8.6.9.3.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition ConEstFail |
|--|

Table 8.6.9.3.3-3: UEInformationResponse (step 15, Table 8.6.9.3.3-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within SystemInformationBlockType1 broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within SystemInformationBlockType1 broadcasted in Cell 1 | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 SEQUENCE { | | | |
| measResultListEUTRA-r11 | Not present | | |
| measResultListGERAN-r11 SEQUENCE { | 1 entry | | |
| carrierFreq SEQUENCE { | | | |
| arfcn | Same as Cell 24 | | |
| bandIndicator | dcs1800 or pcs1900, Same as Cell 24 | | |
| } | | | |
| physCellId SEQUENCE { | | | |
| networkColourCode | Same as Cell 24 | | |
| baseStationColourCode | Same as Cell 24 | | |
| } | | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| rssi | (0..63) | | |
| } | | | |
| } | | | |
| measResultsCDMA2000-r11 | Not present | | |
| } | | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.9.4 Connection Establishment Failure logging / Logging and reporting / Reporting of CDMA2000 Inter-RAT measurements

8.6.9.4.1 Test Purpose (TP)

(1)

```
with { UE in RRC_IDLE state with connection establishment failure information available }
ensure that {
  when { UE successfully performs a RRC connection establishment procedure and the RPLMN is equal to
    plmn-Identity stored in VarConnEstFailReport }
  then { UE transmits the RRCConnectionSetupComplete with IE connEstFailInfoAvailable present }
}
```

(2)

```
with { UE has connection establishment failure information available with the CDMA2000 measurement
  result and the RPLMN is equal to plmn-Identity stored in VarConnEstFailReport }
ensure that {
  when { UE receives a UEInformationRequest message with connEstFailReportReq set to true }
  then { UE sends a UEInformationResponse message with connEstFailReport containing the
    measurement result for CDMA2000 neighbouring cell }
}
```

8.6.9.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.3.3.4, 5.3.3.6 and 5.6.5.3. Unless otherwise stated these are Rel-11 requirements.

[TS 36.331, clause 5.3.3.4]

The UE shall:

...

1> set the content of *RRCConnectionSetupComplete* message as follows:

...

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable*;

2> submit the *RRCConnectionSetupComplete* message to lower layers for transmission, upon which the procedure ends;

[TS 36.331, clause 5.3.3.6]

The UE shall:

1> if timer T300 expires:

2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;

2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:

3> clear the information included in *VarConnEstFailReport*, if any;

3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;

3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;

- 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
- 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements 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/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
- 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;
 - 2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

...

1> else:

- 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.9.4.3 Test description

8.6.9.4.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 15- Cell 1 is E-UTRAN cell, Cell 15 is a HRPD cell.
- All cells belong to the same PLMN.

- System information combination 6 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells with content of CDMA2000 HRPD carrier frequency list in SIB8 set as defined in TS 36.508 [18] table 6.3.1.5-1.

UE:

None.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on Cell 1 according to [18].

8.6.9.4.3.2 Test procedure sequence

Table 8.6.9.4.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.9.4.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 15 | Remark |
|----|-----------------------|--------------|--------|---------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -75 | - | The power level values are such that camping on Cell 1 is guaranteed |
| | lor/loc | dB | - | "Off" | |
| | loc | dBm/1.23 MHz | - | "Off" | |
| | Pilot Ec/lo (NOTE 1) | dB | - | "Off" | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -75 | - | Cell 15 is detectable |
| | lor/loc | dB | - | -20 | |
| | loc | dBm/1.23 MHz | - | -55 | |
| | Pilot Ec/lo (NOTE 1) | dB | - | -20 | |

Table 8.6.9.4.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|------|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS changes Cell 15 parameter according to the row "T1" in Table 8.6.9.4.3.2-1. | - | - | - | - |
| 2 | The SS waits for 20s to ensure that the UE detects CDMA2000 Cell 15. | - | - | - | - |
| 3 | The SS transmits a <i>Paging</i> message on Cell 1. | <-- | <i>Paging</i> | - | - |
| 4 | The UE transmits an <i>RRCCONNECTIONREQUEST</i> message on Cell 1. | --> | <i>RRCCONNECTIONREQUEST</i> | - | - |
| 5 | The SS waits for 2s. Note: the UE may transmit one or more <i>RRCCONNECTIONREQUEST</i> messages but the SS does not answer to these messages. | - | - | - | - |
| 6-13 | Steps 2 to 9 of the generic radio bearer establishment procedure in TS 36.508 subclause 4.5.3.3 are executed to successfully complete the service request procedure on Cell 1. | - | - | 1 | - |
| 14 | The SS sends a <i>UEINFORMATIONREQUEST</i> message with <i>connEstFailReportReq-r11</i> set to true on Cell 1. | <-- | <i>UEINFORMATIONREQUEST</i> | - | - |
| 15 | Check: Does the UE send a <i>UEINFORMATIONRESPONSE</i> message with <i>connEstFailReport-r11</i> on Cell 1? | --> | <i>UEINFORMATIONRESPONSE</i> | 2 | P |

8.6.9.4.3.3 Specific message contents

Table 8.6.9.4.3.3-1: RRCConnectionSetupComplete (step 9, Table 8.6.9.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-18 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| RRCConnectionSetupComplete ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| rrcConnectionSetupComplete-r8 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailInfoAvailable-r11 | true | | |
| nonCriticalExtension SEQUENCE {} | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.9.4.3.3-2: UEInformationRequest (step 14, Table 8.6.9.4.3.2-2)

| |
|--|
| Derivation Path: 36.508, Table 4.6.1-23A, condition ConEstFail |
|--|

Table 8.6.9.4.3.3-3: UEInformationResponse (step 15, Table 8.6.9.4.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|---|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| nonCriticalExtension SEQUENCE { | | | |
| connEstFailReport-r11 SEQUENCE { | | | |
| failedCellId-r11 SEQUENCE { | | | |
| plmn-Identity | plmn-Identity within SystemInformationBlockType1 broadcasted in Cell 1 | | |
| cellIdentity | cellIdentity within SystemInformationBlockType1 broadcasted in Cell 1 | | |
| } | | | |
| locationInfo-r11 | Not present or any allowed value | | |
| measResultFailedCell-r11 SEQUENCE { | | Cell 1 | |
| rsrpResult-r11 | (0..97) | | |
| rsrqResult-r11 | Not present or (0..34) | | |
| } | | | |
| measResultNeighCells-r11 SEQUENCE { | | | |
| measResultListEUTRA-r11 | Not present | | |
| measResultListUTRA-r11 | Not present | | |
| measResultListGERAN-r11 | Not present | | |
| measResultsCDMA2000-r11 SEQUENCE (SIZE (1..maxFreq)) OF { | 1 entry | | |
| carrierFreq-r9[1] SEQUENCE { | Same as Cell 15 | | |
| bandClass | Operating band class under test | | |
| arfcn | f14 | | |
| } | | | |
| measResultList-r9[1] SEQUENCE { | | | |
| preRegistrationStatusHRPD | false | | |
| measResultListCDMA2000 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of Cell 15 | | |
| cgi-Info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| pilotStrength | (0..63) | | |
| } | | | |
| } | | | |
| } | | | |
| numberOfPreamblesSent-r11 | Any allowed value | | |
| contentionDetected-r11 | Any allowed value | | |
| maxTxPowerReached-r11 | Any allowed value | | |
| timeSinceFailure-r11 | Any allowed value | | |
| measResultListEUTRA-v1130 | Not present | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.10 Inter-RAT Immediate MDT

8.6.10.1 Inter-RAT Immediate MDT / Reporting / Location information / Event B2

8.6.10.1.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_CONNECTED state and measurement with event B2 configured with
includeLocationInfo included in the reportConfig }
ensure that {
  when { Entry condition for event B2 is met and detailed location information that has not been
reported is available }
  then { UE sends MeasurementReport message with locationInfo included }
}
```

8.6.10.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.306, clause 4.3.13.2; TS 36.331, clauses 5.5.5 and 5.6.5.3.

[TS 36.306, clause 4.3.13.2]

This parameter defines whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements in RRC_IDLE.

[TS 36.331, clause 5.5.5]

The purpose of this procedure is to transfer measurement results from the UE to E-UTRAN.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

...

- 1> if the *includeLocationInfo* is configured in the corresponding *reportConfig* for this *measId* and detailed location information that has not been reported is available, set the content of the *locationInfo* as follows:
 - 2> include the *locationCoordinates*;
 - 2> if available, include the *gnss-TOD-msec*;

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

...

- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;

...

- 1> if the *logMeasReport* is included in the *UEInformationResponse*:

...

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

8.6.10.1.3 Test description

8.6.10.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 and Cell 7.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cells.

UE:

None.

Preamble:

- 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 36.509 [25] , if supported by the UE according to *pc_UpdateUE_LocationInformation*. Otherwise, or in addition any other suitable method may also be used.
- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.10.1.3.2 Test procedure sequence

Table 8.6.10.1.3.2-1 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. The exact instants on which these values shall be applied are described in the texts in this clause.

Table 8.6.10.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter | Unit | Cell 1 | Cell 7 | Remark |
|----|--------------------------|--------------|--------|--------|--|
| T0 | Cell-specific RS EPRE | dBm/15kHz | -60 | - | The power level values are such that entering conditions for event B2 are not satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -88 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -88 | |
| T1 | Cell-specific RS EPRE | dBm/15kHz | -84 | - | The power level values are such that entering conditions for event B2 are satisfied. |
| | CPICH Ec (UTRA FDD) | dBm/3.84MHz | - | -64 | |
| | PCCPCH Ec (UTRA LCR TDD) | dBm/1.28 MHz | - | -64 | |

Table 8.6.10.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|--|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits an <i>RRConnectionReconfiguration</i> message to setup inter-RAT measurement with <i>includeLocationInfo</i> on Cell 1. | <-- | <i>RRConnectionReconfiguration</i> | - | - |
| 2 | The UE transmits an <i>RRConnectionReconfigurationComplete</i> message to confirm the setup of inter-RAT measurement on Cell 1. | --> | <i>RRConnectionReconfigurationComplete</i> | - | - |
| 3 | The SS changes Cell 1 and Cell 7 parameters according to the row "T1" in table 8.3.2.3.3.2-1. | - | - | - | - |
| 4 | Check: Does the UE transmit a <i>MeasurementReport</i> message to report the event B2 for Cell 7 with <i>locationInfo</i> ? | --> | <i>MeasurementReport</i> | 1 | P |

8.6.10.1.3.3 Specific message contents

Table 8.6.10.1.3.3-1: RRCConnectionReconfiguration (step 1, Table 8.6.10.1.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8, condition MEAS

Table 8.6.10.1.3.3-2: MeasConfig (Table 8.6.10.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-1, condition UTRAN | | | |
|--|--|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasConfig ::= SEQUENCE { | | | |
| measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE{ | 2 entries | | |
| measObjectId[1] | IdMeasObject-f1 | | |
| measObject[1] | MeasObjectEUTRA-GENERIC(f1) | | |
| measObjectId[2] | IdMeasObject-f8 | | |
| measObject[2] | MeasObjectUTRA-f8 | | |
| } | | | |
| reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE{ | 1 entry | | |
| reportConfigId | IdReportConfig-B2-UTRA | | |
| reportConfig | ReportConfigInterRAT-B2-UTRA(-72, -76) | | |
| } | | | |
| measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | 1 entry | | |
| measId | 1 | | |
| measObjectId[1] | IdMeasObject-f8 | | |
| reportConfigId[1] | IdReportConfig-B2-UTRA | | |
| } | | | |
| } | | | |

Table 8.6.10.1.3.3-2A: QuantityConfig (Table 8.6.10.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-3A, condition UTRAN | | | |
|--|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| QuantityConfig ::= SEQUENCE { | | | |
| quantityConfigUTRA SEQUENCE { | | | |
| measQuantityUTRA-FDD | cpich-RSCP | | UTRA-FDD |
| measQuantityUTRA-TDD | pccpch-RSCP | | UTRA-TDD |
| filterCoefficient | fc0 | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.10.1.3.3-2B: MeasObjectUTRA-f8 (Table 8.6.10.1.3.3-1)

| Derivation Path: 36.508, Table 4.6.6-3 MeasObjectUTRA-GENERIC(f8) | | | |
|---|---|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasObjectUTRA -GENERIC(f8) ::= SEQUENCE { | | | |
| carrierFreq | UTRA DL carrier frequency of the cell 7 | | |
| cellsToAddModList CHOICE { | | | |
| cellsToAddModListUTRA-FDD ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE { | | | UTRA-FDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | physicalCellIdentity – Cell 7 | | |
| } | | | |
| cellsToAddModListUTRA-TDD ::= SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE { | | | UTRA-TDD |
| cellIndex[1] | 1 | | |
| physCellId[1] | physicalCellIdentity – Cell 7 | | |
| } | | | |
| } | | | |
| } | | | |

| Condition | Explanation |
|-----------|---------------------------|
| UTRA-FDD | UTRA FDD cell environment |
| UTRA-TDD | UTRA TDD cell environment |

Table 8.6.10.1.3.3-3: *MeasurementReport* (step 4, Table 8.6.10.1.3.2-2)

| Derivation Path: 36.508, Table 4.6.1-5 | | | |
|---|-------------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| MeasurementReport ::= SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE{ | | | |
| measurementReport-r8 SEQUENCE { | | | |
| measResults SEQUENCE { | | | |
| measId | 1 | | |
| measResultPCell SEQUENCE { | | | |
| rsrpResult | (0..97) | | |
| rsrqResult | (0..34) | | |
| } | | | |
| measResultNeighCells CHOICE{ | | | |
| measResultListUTRA SEQUENCE (SIZE | 1 entry | | |
| (1..maxCellReport)) OF SEQUENCE { | | | |
| physCellId[1] | PhysicalCellIdentity of | | |
| | Cell 7 | | |
| cgi-info[1] | Not present | | |
| measResult[1] SEQUENCE { | | | |
| utra-RSCP | (-5..91) | | |
| } | | | |
| } | | | |
| } | | | |
| locationInfo-r11 SEQUENCE { | | | |
| locationCoordinates-r10 CHOICE { | | | |
| ellipsoid-Point-r10 | Any allowed value | | |
| ellipsoidPointWithAltitude-r10 | Any allowed value | | |
| ellipsoidPointWithUncertaintyCircle-r11 | Any allowed value | | |
| ellipsoidPointWithAltitudeAndUncertaintyEllipsoid-r11 | Any allowed value | | |
| ellipsoidArc-r11 | Any allowed value | | |
| polygon-r11 | Any allowed value | | |
| } | | | |
| horizontalVelocity-r10 | Any allowed value | | |
| gnss-TOD-msec-r10 | Any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.6.11 RACH Optimisation

8.6.11.1 RACH Optimisation

8.6.11.1.1 Test Purpose (TP)

(1)

```

with { UE is in E-UTRA RRC_CONNECTED state }
ensure that {
  when { UE receives UEInformationRequest message with rach-ReportReq set to true }
  then { UE transmits UEInformationResponse message with a rach-Report }
}

```

8.6.11.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.331, clause 5.6.5.3.

[TS 36.331, clause 5.6.5.3]

Upon receiving the *UEInformationRequest* message, the UE shall:

- 1> if *rach-ReportReq* is set to *true*, set the contents of the *rach-Report* in the *UEInformationResponse* message as follows:
 - 2> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the last successfully completed random access procedure;
 - 2> if contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the last successfully completed random access procedure:
 - 3> set the *contentionDetected* to *true*;
 - 2> else:
 - 3> set the *contentionDetected* to *false*;

8.6.11.1.3 Test description

8.6.11.1.3.1 Pre-test conditions

System Simulator:

- Cell 1

UE:

None.

Preamble:

- The UE is in state Generic RB Established (state 3) on Cell 1 according to [18].

8.6.11.1.3.2 Test procedure sequence

Table 8.6.11.1.3.2-1: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|--|------------------|------------------------------|----|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a <i>UEInformationRequest</i> message. | <-- | <i>UEInformationRequest</i> | - | - |
| 2 | Check: Does the UE transmit a <i>UEInformationResponse</i> message with <i>rach-Report</i> ? | --> | <i>UEInformationResponse</i> | 1 | P |

8.6.11.1.3.3 Specific message contents

Table 8.6.11.1.3.3-1: *UEInformationRequest* (step 1, Table 8.6.11.1.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-23A | | | |
|---|--------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| <i>UEInformationRequest</i> -r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationRequest-r9 SEQUENCE { | | | |
| <i>rach-ReportReq</i> -r9 | TRUE | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

Table 8.6.11.1.3.3-2: *UEInformationResponse* (step 2, Table 8.6.11.1.3.2-1)

| Derivation Path: 36.508, Table 4.6.1-23B | | | |
|--|-------------------|---------|-----------|
| Information Element | Value/remark | Comment | Condition |
| UEInformationResponse-r9 ::=SEQUENCE { | | | |
| criticalExtensions CHOICE { | | | |
| c1 CHOICE { | | | |
| ueInformationResponse-r9 SEQUENCE { | | | |
| rach-Report-r9 SEQUENCE { | | | |
| numberOfPreamblesSent-r9 | Any allowed value | | |
| contentionDetected-r9 | Any allowed value | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |
| } | | | |

8.7 Automatic Neighbour Relation (ANR) for UTRAN

8.7.1 Inter-RAT / UTRAN ANR measurement, logging and reporting / E-UTRAN cell

8.7.1.1 Test Purpose (TP)

(1)

```

with { UE in UTRA CELL_DCH state }
ensure that {
  when { UE receives a LOGGING MEASUREMENT CONFIGURATION message containing Logged ANR configuration
Info with E-UTRA Indicator set to TRUE }
  then { UE reads "Logged ANR configuration info" and configure UE to perform inter-RAT ANR
measurements for E-UTRAN to be reported in the logged ANR report provided to the network in the UE
INFORMATION RESPONSE message }
}

```

(2)

```

with { UE in E-UTRA RRC IDLE state and T327 timer is running }
ensure that {
  when { UE performs cell reselection to a UTRAN cell belonging to the PLMN or the list of
Equivalent PLMNs where the Logging Measurement Configuration was received and source E-UTRAN cell is
not included in the blacklist for the E-UTRAN frequency in SIB 19 on target UTRAN cell }
  then { UE performs inter-RAT ANR logging for the E-UTRAN cell to be reported in the logged ANR
report provided to the network in the UE INFORMATION RESPONSE message }
}

```

(3)

```

with { UE in UTRA IDLE state and UE has a Inter-RAT ANR logging measurement stored for E-UTRAN cell
and the registered PLMN is the same as the IE "PLMN Identity" stored in LOG_ANR_REPORT_VARIABLE }
ensure that {
  when { receiving RRC CONNECTION SETUP message }
  then { UE includes the ANR Logging Results Available IE in the RRC CONNETION SETUP COMPLETE
message }
}

```

(4)

```

with { UE in UTRA CELL_DCH state and UE has inter-RAT ANR logging results available for E-UTRAN and
the registered PLMN is the same as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE }
ensure that {
  when { UE receives an UE INFORMATION REQUEST message with Logged ANR Report Request IE which is
asking for ANR log from UE }
  then { UE sends an UE INFORMATION RESPONSE message with ANR logged data for E-UTRAN }
}

```

8.7.1.2 Conformance requirements

References: The conformance requirements covered in the current TC is specified in: TS 25.304, clauses 5.8.2.2; TS 25.331, clauses 8.1.3.6, 8.5.63.3, 8.5.64.3 and 8.5.67.2

[TS 25.304, clause 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, 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 8.5.64.3 (TP4)]

The UE shall:

- 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 8.5.67.2 (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 E-UTRA Indicator" is included in variable LOG_ANR_CONFIG:
 - 3> if the UE reselected from a E-UTRA cell to an UTRA cell (serving cell) that is part of the PLMN which is the same PLMN as the IE "PLMN Identity" stored in variable LOG_ANR_REPORT_VARIABLE; and
 - 3> if the previously camped E-UTRAN cell is not included in the blacklist for the EUTRAN frequency in SIB19 of the serving cell; and
 - 3> if both the previously camped E-UTRAN cell and serving cell are not CSG cells:
 - 4> log the ANR information into the variable LOG_ANR_REPORT_VARIABLE, if E-UTRA related ANR information has not been logged before, as follows:
 - 5> set the IEs "Serving PLMN Identity" and "Serving Cell" to indicate cell identity of the serving cell;
 - 5> set the IE "Cell Identity" to indicate cell identity of this previously camped E-UTRAN cell;
 - 5> set the IE "PLMN Identity" to indicate the Primary PLMN which this previously camped E-UTRAN cell belongs to;
 - 5> set the IE "Tracking Area Code" to indicate the TAC which this previously camped E-UTRAN cell belongs to;
 - 5> set the IE "EARFCN" and "Physical Cell Identity" of this previously camped E-UTRAN cell.

8.7.1.3 Test Description

8.7.1.3.1 Pre-test conditions

System Simulator:

- SS shall use Rel-10 branch of UTRAN ASN.1 for downlink messages.
- Cell 1 and Cell 5.
- System information combination 4 as defined in TS 36.508 [18] clause 4.4.3.1 is used in E-UTRA cell: Cell 1.
- System Information Block type 19 as defined in TS 36.508 [18] clause 4.4.4.1 is used in UTRA cell: Cell 5.

UE:

None.

Preamble:

- The UE is in CELL_DCH (state 6-9) on Cell 5 (serving cell) according to clause 7.4 of TS 34.108.

8.7.1.3.2 Test procedure sequence

Table 8.7.1.3.2-1 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" and "T2" are to be applied subsequently. The exact instants on which these values are applied are described in the texts in this clause.

Table 8.7.1.3.2-1: Time instances of cell power level and parameter changes

| | Parameter name | Unit | Cell 1 | Cell 5 | Remark |
|----|----------------|--------------|--------|--------|--|
| T0 | RS EPRE | dBm/15kHz | -115 | - | |
| | CPICH_Ec | dBm/3.84 MHz | - | -60 | |
| | P-CCPCH | dBm/1.28 MHz | - | -62 | |
| T1 | RS EPRE | dBm/15kHz | -60 | - | UE performs cell reselection from Cell 5 to Cell 1 |
| | CPICH_Ec | dBm/3.84 MHz | - | -70 | |
| | P-CCPCH | dBm/1.28 MHz | - | -72 | |
| T2 | RS EPRE | dBm/15kHz | -115 | - | UE performs cell reselection from Cell 1 to Cell 5 |
| | CPICH_Ec | dBm/3.84 MHz | - | -60 | |
| | P-CCPCH | dBm/1.28 MHz | - | -62 | |

Table 8.7.1.3.2-2: Main behaviour

| St | Procedure | Message Sequence | | TP | Verdict |
|----|---|------------------|-----------------------------------|-------|---------|
| | | U - S | Message | | |
| 1 | The SS transmits a LOGGING MEASUREMENT CONFIGURATION message including to configure the UE to perform inter-RAT ANR logging for E-UTRA on Cell 5. | <-- | LOGGING MEASUREMENT CONFIGURATION | - | - |
| 2 | The SS transmits an RRC CONNECTION RELEASE message on CCCH. | <-- | RRC CONNECTION RELEASE | - | - |
| 3 | The SS changes Cell 1 and Cell 5 levels according to the row "T1" in table 8.7.1.3.2-1. | - | - | - | - |
| 4 | Generic test procedure in TS 36.508 Table 6.4.2.7A is performed on Cell 1. | - | - | - | - |
| 5 | Wait for 6 s for UE to receive system information. | | | | |
| 6 | The SS changes Cell 1 and Cell 5 levels according to the row "T2" in table 8.7.1.3.2-1. | - | - | - | - |
| 7 | Generic test procedure in TS 36.508 Table 6.4.2.8 is performed on Cell 5. And the UE move to idle mode on Cell 5. | - | - | - | - |
| 8 | Wait for [TBD] seconds to allow UE to activate ANR logging. | - | - | - | - |
| 9 | The SS transmits a Paging message to the UE. | <-- | PAGING | - | - |
| 10 | The UE sends an RRC CONNECTION REQUEST message. | --> | RRC CONNECTION REQUEST | - | - |
| 11 | The SS transmits an RRC CONNECTION SETUP message. | <-- | RRC CONNECTION SETUP | - | - |
| 12 | Check: Does the UE sends an RRC CONNECTION SETUP COMPLETE with the IE "ANR Logging Results Available". | --> | RRC CONNECTION SETUP COMPLETE | 3 | P |
| 13 | The SS transmits a UE INFORMATION REQUEST message on Cell 5. | <-- | UE INFORMATION REQUEST | - | - |
| 14 | Check: Does the UE send UE INFORMATION RESPONSE with the IE "Logged ANR Report Info". | --> | UE INFORMATION RESPONSE | 1,2,4 | P |

8.7.1.3.3 Specific message contents

Table 8.7.1.3.3-1: LOGGING MEASUREMENT CONFIGURATION (step 1, Table 8.7.1.3.2-2)

| Derivation path: 34.108 default LOGGING MEASUREMENT CONFIGURATION in section 9.1.1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Logged Measurements Configuration Info | | | |
| Logged ANR configuration Info | | | |
| - Logging Duration | 1 hour | | |
| - Inter-RAT ANR for E-UTRA Indicator | TRUE | | |

Table 8.7.1.3.3-2: RRC CONNECTION SETUP COMPLETE (step 12, Table 8.7.1.3.2-2)

| Derivation path: 34.108 default RRC CONNECTION SETUP COMPLETE in section 9.1.1 | | | |
|--|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Other information elements | | | |
| Deferred measurement control reading | | | |
| -ANR Logging Results Available | TRUE | | |

Table 8.7.1.3.3-3: UE INFORMATION REQUEST (step 13, Table 8.7.1.3.2-2)

| Derivation path: 34.108 default UE INFORMATION REQUEST in section 9.1.1 | | | |
|---|--------------|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Logged ANR Report Request | TRUE | | |

Table 8.7.1.3.3-4: UE INFORMATION RESPONSE (step 14, Table 8.7.1.3.2-2)

| Derivation path: 34.108 default UE INFORMATION RESPONSE in section 9.1.1 | | | |
|--|---|---------|-----------|
| Information Element | Value/Remark | Comment | Condition |
| Logged ANR Report Info List | | | |
| -Serving PLMN Identity | PLMN Identity of Cell 5 | | |
| -Serving Cell | Cell Identity of Cell 5 | | |
| -CHOICE <i>logged cell info</i> | | | |
| -E-UTRA | | | |
| - PLMN Identity | PLMN Identity within System Information Block Type1 broadcasted in Cell 1 | | |
| - Tracking Area Code | Tracking Area Code of Cell 1 | | |
| - Cell Identity | Cell Identity within System Information Block Type1 broadcasted in Cell 1 | | |
| - EARFCN | Same downlink EARFCN as used in Cell 1 | | |
| - Physical Cell identity | Physical Cell Identity of Cell 1 | | |