**3GPP TSG-RAN4 Meeting #98-e *R4-2103546***

**Electronic Meeting, Jan 25-Feb 05, 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.174** | **CR** | **draftCR** | **rev** | **1** | **Current version:** | **16.1.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | RRC re-establishment tests for LA IAB-MT | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IAB-Perf | | | | |  | ***Date:*** | | | 2021-01-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | To defining RRM test cases to verify RRC re-establishment requirements for LA IAB-MT | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The following test cases are defined:   * RRC re-establishment to unknown inter-frequency cell in FR1 * RRC re-establishment to unknown intra-frequency cell when IAB-MT does not know serving cell timing in FR1 * RRC re-establishment to unknown inter-frequency cell in FR2 * RRC re-establishment to unknown intra-frequency cell when IAB-MT does not know serving cell timing in FR2.   All tests are applicable for local area IAB-MT. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | RRC re-establishment requirements for LA IAB-MT cannot be verified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | G.2.1.1.1.1, G.2.1.1.1.2, G.2.1.1.1.3, G.2.1.1.1.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**----------------------START OF CHANGES----------------------------**

##### G.2.1.1.1.1 Inter-frequency RRC Re-establishment in FR1 for LA IAB-MT

G.2.1.1.1.1.1 Test Purpose and Environment

The purpose is to verify that the NR inter-frequency RRC re-establishment delay in FR1 to an unknown target cell is within the specified limits. These tests will verify the requirements in clause 12.1.1.1. This test case is applicable only for local area IAB-MT and for IAB type 1-H.

The test parameters are given in table G.2.1.1.1.1.1-1, table G.2.1.1.1.1.1-2 and table G.2.1.1.1.1.1-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, becomes inactive. The time period T3 starts after the occurrence of the radio link failure. During T1, the IAB-MT shall be configured with the carrier frequency of cell 2 (with RF Channel Number #2) to ensure that the IAB-MT has the context of the carrier frequency of cell 2 by the end of T1.

Table G.2.1.1.1.1.1-1: Supported test configurations

|  |  |  |
| --- | --- | --- |
| Configuration | Description of serving cell | Description of target cell |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 2 | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note: The IAB-MT is only required to be tested in one of the supported test configurations. | | |

Table G.2.1.1.1.1.1-2: General test parameters for NR inter-frequency RRC Re-establishment test case in FR1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
| Initial condition | Active cell |  | 1, 2 | Cell1 |  |
|  | Neighbour cells |  | 1, 2 | Cell2 |  |
| Final condition | Active cell |  | 1, 2 | Cell2 |  |
| RF Channel Number | |  | 1, 2 | 1, 2 |  |
| Time offset between cells | |  | 1, 2 | 3 μs | Synchronous cells |
| N310 | | - | 1, 2 | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1, 2 | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 1, 2 | 0 | Radio link failure timer; T310 is disabled |
| T311 | | ms | 1, 2 | 30000 | RRC re-establishment timer |
| Access Barring Information | | - | 1, 2 | Not Sent | No additional delays in random access procedure. |
| SSB configuration | |  | 1 | SSB.1 FR1 |  |
|  | | 2 | SSB.2 FR1 |  |
| SMTC configuration | |  | 1 | SMTC pattern 1 |  |
|  | | 2 | SMTC pattern 1 |  |
| DRX cycle length | | s | 1, 2 | OFF |  |
| PRACH configuration | |  | 1, 2 | FR1 PRACH configuration 1 | TBD |
| T1 | | s | 1, 2 | 20 |  |
| T2 | | ms | 1, 2 | 1000 | Time for the IAB-MT to detect RLF |
| T3 | | s | 1, 2 | 20 |  |

Table G.2.1.1.1.1.1-3: Cell specific test parameters for NR inter-frequency RRC Re-establishment test case in FR1

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | | Cell 2 | | | | |
|  |  |  | T1 | | T2 | T3 | T1 | T2 | | | T3 |
| RF Channel Number |  | 1, 2 | 1 | | | | 2 | | | | |
| TDD configuration |  | 1 | TDDConf.1.1 | | | | TDDConf.1.1 | | | | |
|  |  | 2 | TDDConf.2.1 | | | | TDDConf.2.1 | | | | |
| PDSCH RMC configuration |  | 1 | SR.1.1 FDD | | | | N/A | | | | |
|  |  | 2 | SR.1.1 TDD | | | |  | | | | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 TDD | | | | CR.1.1 TDD | | | | |
|  |  | 2 | CR.2.1 TDD | | | | CR.2.1 TDD | | | | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.1 TDD | | | | CCR.1.1 TDD | | | | |
|  |  | 2 | CCR.2.1 TDD | | | | CCR.2.1 TDD | | | | |
| OCNG Pattern |  | 1, 2 | OP.1 defined in TBD | | | | OP.1 defined in TBD | | | | |
| TRS configuration |  | 1 | TRS.1.1 TDD | | | | N/A | | | | |
|  |  | 2 | TRS.1.2 TDD | | | |  | | | | |
| Initial DL BWP configuration |  | 1, 2 | DLBWP.0 | | | | DLBWP.0 | | | | |
| Initial UL BWP configuration |  | 1, 2 | ULBWP.0 | | | | ULBWP.0 | | | | |
| Active DL BWP confgiuration |  | 1, 2 | DLBWP.1.1 | N/A | | N/A | N/A | | N/A | DLBWP.1.1 | |
| Active UL BWP configuration |  | 1, 2 | ULBWP.1.1 | N/A | | N/A | N/A | | N/A | ULBWP.1.1 | |
| RLM-RS |  | 1, 2 | SSB | | | | SSB | | | | |
|  | dB | 1, 2 | 4 | | -infinity | -infinity | -infinity | -infinity | | | 7 |
| Note2 | dBm/SCS | 1 | -98 | | | | | | | | |
|  |  | 2 | -95 | | | | | | | | |
| Note2 | dBm/15 kHz | 1, 2 | -98 | | | | | | | | |
|  | dB | 1, 2 | 4 | | -infinity | -infinity | -infinity | -infinity | | | 7 |
| SS-RSRP Note3 | dBm/SCS | 1 | -94 | | -infinity | -infinity | -infinity | -infinity | | | -91 |
|  |  | 2 | -91 | | -infinity | -infinity | -infinity | -infinity | | | -88 |
| Io | dBm/9.36 MHz | 1 | -64.59 | | -70. 05 | -70. 05 | -70. 05 | -70. 05 | | | -62.26 |
| dBm/38.16 MHz | 2 | -58.50 | | -63.94 | -63.94 | -63.94 | -63.94 | | | -56.15 |
| Propagation Condition |  | 1, 2 | AWGN | | | | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | | | | |

G.2.1.1.1.1.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the IAB-MT starts to send PRACH preambles to cell 2 for sending the *RRCReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NR inter frequency cell shall be less than 14.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception is used as a trigger for the completion of the test; hence TUL\_grant is not used.

Nfreq = 2

Tidentify\_intra\_NR = 6400 ms

Tidentify\_inter\_NR = 6400 ms

TSI = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 38.331 for the target inter-frequency NR cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 14495 ms, allow 14.5 s in the test case.

##### G.2.1.1.1.2 Intra-frequency RRC Re-establishment in FR1 without serving cell timing for LA IAB-MT

G.2.1.1.1.2.1 Test Purpose and Environment

The purpose is to verify that the NR intra-frequency RRC re-establishment delay in FR1 without serving cell timing is within the specified limits. These tests will verify the requirements in clause 12.1.1.1. This test case is applicable only for local area IAB-MT and for IAB type 1-H.

The test parameters are given in table G.2.1.1.1.2.1-1, table G.2.1.1.1.2.1-2 and table G.2.1.1.1.2.1-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table G.2.1.1.1.2.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode |
| 2 | 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode |
| Note: The IAB-MT is only required to be tested in one of the supported test configurations. | |

**Table G.2.1.1.1.2.1-2: General test parameters for NR intra-frequency RRC Re-establishment test case in FR1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
| Initial condition | Active cell |  | 1, 2 | Cell1 |  |
|  | Neighbour cells |  | 1, 2 | Cell2 |  |
| Final condition | Active cell |  | 1, 2 | Cell2 |  |
| RF Channel Number | |  | 1, 2 | 1, 2 |  |
| Time offset between cells | |  | 1, 2 | 3 μs | Synchronous cells |
| N310 | | - | 1, 2 | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1, 2 | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 1, 2 | 6000 | Radio link failure timer configured by *RLF-TimersAndConstants* |
| T311 | | ms | 1, 2 | 15000 | RRC re-establishment timer |
| Access Barring Information | | - | 1, 2 | Not Sent | No additional delays in random access procedure. |
| SSB configuration | |  | 1 | SSB.1 FR1 |  |
|  | | 2 | SSB.2 FR1 |  |
| SMTC configuration | |  | 1 | SMTC pattern 1 |  |
|  | | 2 | SMTC pattern 1 |  |
| DRX cycle length | | s | 1, 2 | OFF |  |
| PRACH configuration | |  | 1, 2 | FR1 PRACH configuration 1 | TBD |
| T1 | | s | 1, 2 | 10 |  |
| T2 | | s | 1, 2 | 7 | Time for the IAB-MT to detect RLF |
| T3 | | s | 1, 2 | 10 |  |

Table G.2.1.1.1.2.1-3: Cell specific test parameters for NR intra-frequency RRC Re-establishment test case in FR1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | |
|  |  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| TDD configuration |  | 1 | TDDConf.1.1 | | | TDDConf.1.1 | | |
|  |  | 2 | TDDConf.2.1 | | | TDDConf.2.1 | | |
| PDSCH RMC configuration |  | 1 | SR.1.1 TDD | | | N/A | | |
|  |  | 2 | SR.2.1 TDD | | |  | | |
| RMSI CORESET RMC configuration |  | 1 | CR.1.1 TDD | | | CR.1.1 TDD | | |
|  |  | 2 | CR.2.1 TDD | | | CR.2.1 TDD | | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.1.1 TDD | | | CCR.1.1 TDD | | |
|  |  | 2 | CCR.2.1 TDD | | | CCR.2.1 TDD | | |
| OCNG Pattern |  | 1, 2 | OP.1 defined in TBD | | | OP.1 defined in TBD | | |
| Initial DL BWP configuration |  | 1, 2 | DLBWP.0.1 | | | DLBWP.0.1 | | |
| Initial UL BWP configuration |  | 1, 2 | ULBWP.0.1 | | | ULBWP.0.1 | | |
| RLM-RS |  | 1, 2 | SSB | | | SSB | | |
|  | dB | 1, 2 | 4 | -infinity | -infinity | -infinity | -infinity | 4 |
| Note2 | dBm/SCS | 1 | -98 | | | | | |
|  |  | 2 | -95 | | | | | |
| Note2 | dBm/15 kHz | 1, 2 | -98 | | | | | |
|  | dB | 1, 2 | 4 | -infinity | -infinity | -infinity | -infinity | 4 |
| SS-RSRP Note3 | dBm/SCS | 1 | -94 | -infinity | -infinity | -infinity | -infinity | -94 |
|  |  | 2 | -91 | -infinity | -infinity | -infinity | -infinity | -91 |
| Io | dBm/9.36 MHz | 1 | -64.59 | -infinity | -infinity | -infinity | -infinity | -64.59 |
|  | dBm/9.36 MHz | 2 | -58.50 | -infinity | -infinity | -infinity | -infinity | -58.50 |
| Propagation Condition |  | 1, 2 | AWGN | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. | | | | | | | | |

G.2.1.1.1.2.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the IAB-MT starts to send PRACH preambles to cell 2 for sending the *RRCReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NR intra frequency cell without serving cell timing shall be less than 8.1 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception is used as a trigger for the completion of the test; hence TUL\_grant is not used.

Nfreq = 1

Tidentify\_intra\_NR = 6400 ms

TSI = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 38.331 [2] for the target intra-frequency NR cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 8095 ms, allow 8.1 s in the test case.

##### G.2.1.1.1.3 Inter-frequency RRC Re-establishment in FR2 for LA IAB-MT

G.2.1.1.1.3.1 Test Purpose and Environment

The purpose is to verify that the NR inter-frequency RRC re-establishment delay in FR2 without known target cell is within the specified limits. These tests will verify the requirements in clause 12.1.1.1. This test case is applicable only for local area IAB-MT and for IAB type 2-O.

The test parameters are given in table G.2.1.1.1.3.1-1, table G.2.1.1.1.3.1-2 and table G.2.1.1.1.3.1-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, becomes inactive. The time period T3 starts after the occurrence of the radio link failure. During T1, the IAB-MT shall be configured with the carrier frequency of cell 2 (with RF Channel Number #2) to ensure that the IAB-MT has the context of the carrier frequency of cell 2 by the end of T1.

Table G.2.1.1.1.3.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | NR 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

Table G.2.1.1.1.3.1-2: General test parameters for NR inter-frequency RRC Re-establishment test case in FR2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | | **Unit** | **Test configuration** | **Value** | **Comment** |
| Initial condition | Active cell |  | 1 | Cell1 |  |
|  | Neighbour cells |  | 1 | Cell2 |  |
| Final condition | Active cell |  | 1 | Cell2 |  |
| RF Channel Number | |  | 1 | 1, 2 |  |
| Time offset between cells | |  | 1 | 3 μs | Synchronous cells |
| N310 | | - | 1 | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 1 | 0 | Radio link failure timer; T310 is disabled |
| T311 | | ms | 1 | 30000 | RRC re-establishment timer |
| Access Barring Information | | - | 1 | Not Sent | No additional delays in random access procedure. |
| SSB configuration | |  | 1 | SSB.1 FR2 |  |
|  | |  | 1 | SMTC pattern 1 |  |
| DRX cycle length | | s | 1 | OFF |  |
| PRACH configuration | |  | 1 | FR2 PRACH configuration 1 | Table TBD |
| T1 | | s | 1 | 10 |  |
| T2 | | ms | 1 | 4800 | Time for the IAB-MT to detect RLF |
| T3 | | s | 1 | 20 |  |

Table G.2.1.1.1.3.1-3: Cell specific test parameters for NR inter-frequency RRC Re-establishment test case in FR2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | |
|  |  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| Assumption for IAB-MT beamsNote 4 |  |  | Rough | | | Rough | | |
| AoA setup |  | 1 | Setup 2 as specified in clause G.1.8.2 | | | | | |
| TDD configuration |  | 1 | TDDConf.3.1 | | | TDDConf.3.1 | | |
| PDSCH RMC configuration |  | 1 | SR.3.1 TDD | | | N/A | | |
| RMSI CORESET RMC configuration |  | 1 | CR.3.1 TDD | | | CR.3.1 TDD | | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.3.1 TDD | | | CCR.3.1 TDD | | |
| TRS configuration |  | 1 | TRS.2.1 TDD | | | N/A | | |
| PDSCH/PDCCH TCI state |  | 1 | TCI.State.2 | | | N/A | | |
| OCNG Pattern |  | 1 | OP.1 defined in TBD | | | OP.1 defined in TBD | | |
| Initial DL BWP configuration |  | 1 | DLBWP.0.1 | | | DLBWP.0.1 | | |
| Initial UL BWP configuration |  | 1 | ULBWP.0.1 | | | ULBWP.0.1 | | |
| RLM-RS |  | 1 | SSB | | | SSB | | |
|  | dB | 1 | 5 | -infinity | -infinity | -infinity | -infinity | 8 |
| Note2 | dBm/15 kHz | 1 | -98 | | | | | |
| Note2 | dBm/SCS | 1 | -89 | | | | | |
|  | dB | 1 | 5 | -infinity | -infinity | -infinity | -infinity | 8 |
| SS-RSRP Note3 | dBm/SCS | 1 | -84 | -infinity | -infinity | -infinity | -infinity | -81 |
| Io | dBm/95.04 MHz | 1 | -53.82 | -infinity | -infinity | -infinity | -infinity | -51.37 |
| Propagation Condition |  | 1 | AWGN | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Information about types of IAB-MT beam is given in B.2.1.3, and does not limit IAB-MT implementation or test system implementation | | | | | | | | |

G.2.1.1.1.3.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the IAB-MT starts to send PRACH preambles to cell 2 for sending the *RRCReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NR inter frequency cell shall be less than 18 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception is used as a trigger for the completion of the test; hence TUL\_grant is not used.

Nfreq = 2

Tidentify\_intra\_NR = 8000 ms

Tidentify\_inter\_NR = 8000 ms

TSI = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 38.331 for the target inter-frequency NR cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 17695 ms, allow 18 s in the test case.

##### G.2.1.1.1.4 Intra-frequency RRC Re-establishment in FR2 without serving cell timing for LA IAB-MT

G.2.1.1.1.4.1 Test Purpose and Environment

The purpose is to verify that the NR intra-frequency RRC re-establishment delay in FR2 without serving cell timing is within the specified limits. These tests will verify the requirements in clause 12.1.1.1. This test case is applicable only for local area IAB-MT and for IAB type 2-O.

The test parameters are given in table G.2.1.1.1.4.1-1, table G.2.1.1.1.4.1-2 and table G.2.1.1.1.4.1-3 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table G.2.1.1.1.4.1-1: Supported test configurations

|  |  |
| --- | --- |
| Configuration | Description |
| 1 | 120 kHz SSB SCS, 100 MHz bandwidth, TDD duplex mode |

Table G.2.1.1.1.4.1-2: General test parameters for NR intra-frequency RRC Re-establishment test case in FR2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | | Unit | Test configuration | Value | Comment |
| Initial condition | Active cell |  | 1 | Cell1 |  |
|  | Neighbour cells |  | 1 | Cell2 |  |
| Final condition | Active cell |  | 1 | Cell2 |  |
| RF Channel Number | |  | 1 | 1 |  |
| Time offset between cells | |  | 1 | 3 μs | Synchronous cells |
| N310 | | - | 1 | 1 | Maximum consecutive out-of-sync indications from lower layers |
| N311 | | - | 1 | 1 | Minimum consecutive in-sync indications from lower layers |
| T310 | | ms | 1 | 6000 | Radio link failure timer configured by *RLF-TimersAndConstants* |
| T311 | | ms | 1 | 30000 | RRC re-establishment timer |
| Access Barring Information | | - | 1 | Not Sent | No additional delays in random access procedure. |
| SSB configuration | |  | 1 | SSB.1 FR2 |  |
| SMTC configuration | |  | 1 | SMTC pattern 1 |  |
| DRX cycle length | | s | 1 | OFF |  |
| PRACH configuration | |  | 1 | FR2 PRACH configuration 1 | Table TBD |
| T1 | | s | 1 | 10 |  |
| T2 | | s | 1 | 10800 | Time for the IAB-MT to detect RLF |
| T3 | | s | 1 | 30 |  |

Table G.2.1.1.1.4.1-3: Cell specific test parameters for NR intra-frequency RRC Re-establishment test case in FR2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Unit | Test configuration | Cell 1 | | | Cell 2 | | |
|  |  |  | T1 | T2 | T3 | T1 | T2 | T3 |
| Assumption for IAB-MT beamsNote 4 |  |  | Rough | | | Rough | | |
| AoA setup |  | 1 | Setup 2 as specified in clause G.1.8.2 | | | | | |
| TDD configuration |  | 1 | TDDConf.3.1 | | | TDDConf.3.1 | | |
|  |  | 1 | SR.3.1 TDD | | | N/A | | |
| RMSI CORESET RMC configuration |  | 1 | CR.3.1 FDD | | | CR.3.1 FDD | | |
| Dedicated CORESET RMC configuration |  | 1 | CCR.3.1 FDD | | | CCR.3.1 FDD | | |
| TRS configuration |  | 1 | TRS.2.1 TDD | | | N/A | | |
| TCI state |  | 1 | CSI-RS.Config.0 | | | N/A | | |
| OCNG Pattern |  | 1 | OP.1 defined in TBD | | | OP.1 defined in TBD | | |
| Initial DL BWP configuration |  | 1 | DLBWP.0.1 | | | DLBWP.0.1 | | |
| Initial UL BWP configuration |  | 1 | ULBWP.0.1 | | | ULBWP.0.1 | | |
| RLM-RS |  | 1 | SSB | | | SSB | | |
| AoA setup |  | 1 | Setup 1 defined in TBD | | | Setup 1 defined in TBD | | |
|  | dB | 1 | 5 | -infinity | -infinity | -infinity | -infinity | 5 |
| Note2 | dBm/SCS | 1 | -98 | | | | | |
| Note2 | dBm/15 kHz | 1 | -89 | | | | | |
|  | dB | 1 | 5 | -infinity | -infinity | -infinity | -infinity | 5 |
| SS-RSRP Note3 | dBm/SCS | 1 | -93 | -infinity | -infinity | -infinity | -infinity | -93 |
| Io | dBm/95.04 MHz | 1 | -62.82 | -infinity | -infinity | -infinity | -infinity | -62.82 |
| Propagation Condition |  | 1 | AWGN | | | | | |
| Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.  Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  to be fulfilled.  Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.  Note 4: Information about types of IAB-MT beam is given in B.2.1.3, and does not limit IAB-MT implementation or test system implementation | | | | | | | | |

G.2.1.1.1.4.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the IAB-MT starts to send PRACH preambles to cell 2 for sending the *RRCReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown NR intra frequency cell without serving cell timing shall be less than 30 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

Where:

TUL\_grant = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception is used as a trigger for the completion of the test; hence TUL\_grant is not used.

Nfreq = 1

Tidentify\_intra\_NR = 28160 ms

TSI = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 38.331 [2] for the target intra-frequency NR cell.

TPRACH = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 29855 ms, allow 30 s in the test case.

**----------------------END OF CHANGES----------------------------**