**3GPP TSG RAN WG4 Meeting #95-e R4-2008596**

**Electronic Meeting, May 25-June 05, 2020**

**Agenda Item:** 6.5.3.1

**Source:** Nokia, Nokia Shanghai Bell

**Title:** TP to TS 38.174 V0.0.1: Correction on IAB RRM requirements

**Document for:** Approval

1. Introduction

In RAN4#94e-bis meeting, TP on 38.174 RRM requirements was agreed in R4-2004801, however, some parts still need to be corrected. Below changes are made in this TP:

1) Correct the equation with IAB-MT in 12.1.1.1.2

2) Remove the ‘E-UTRAN or’ as only discussing NR SA in 12.1.1.3.

3) Add ‘for TDD’ to clarify that the requirements are only apply for TDD band in 12.2.3.

4) Update the reference to [6] instead of 38.133 in several places

5) Unify the same wording to refer to 38.133 requirements in 12.3.2.5.3, 12.3.2.6.3, 12.3.2.7 and 12.3.2.8.

6) Update the References number to 38.331, 38.211, 38.213 according to R4-2007991

These additional changes in RAN4#95e on top of R4-2004801 have been highlighted.

# Text Proposal

--------------------------------------------------Start of TP------------------------------------------------------

# 12 Radio Resource Management requirements

## 12.1 RRC\_CONNECTED state mobility for IAB-MTs

### 12.1.1 RRC Connection Mobility Control

#### 12.1.1.1 SA: RRC Re-establishment

##### 12.1.1.1.1 Introduction

This clause contains requirements on the IAB-MT regarding RRC connection re-establishment procedure. RRC connection re-establishment is initiated when an IAB-MT in RRC\_CONNECTED state loses RRC connection due to any of failure cases, including radio link failure, handover failure, and RRC connection reconfiguration failure. The RRC connection re-establishment procedure is specified in clause TBD of TS 38.331 [15].

The requirements in this clause are applicable for RRC connection re-establishment to NR cell.

##### 12.1.1.1.2 Requirements

In RRC\_CONNECTED state the IAB-MT shall be capable of sending *RRCReestablishmentRequest* message within Tre-establish\_delay seconds from the moment it detects a loss in RRC connection. The total RRC connection delay (Tre-establish\_delay) shall be less than:

TUL\_grant: It is the time required to acquire and process uplink grant from the target PCell. The uplink grant is required to transmit *RRCReestablishmentRequest* message.

The IAB-MT re-establishment delay (TIAB-MT\_re-establish\_delay) is specified in clause 12.1.1.1.2.1.

###### 12.1.1.1.2.1 IAB MT Re-establishment delay requirement

The IAB-MT re-establishment delay (TIAB-MT\_re-establish\_delay) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause TBD in TS 38.331 [15] is detected by the IAB-MT and when the IAB-MT sends PRACH to the target PCell. The IAB-MT re-establishment delay (TIAB-MT\_re-establish\_delay) requirement shall be less than:

The intra-frequency target NR cell shall be considered detectable if each relevant SSB can satisfy that:

- SS-RSRP related side conditions given in Annex TBD are fulfilled for a corresponding NR Band for FR1 and FR2, respectively, and

- the conditions of SSB\_RP and SSB Ês/Iot according to Annex TBD for a corresponding NR Band are fulfilled.

The inter-frequency target NR cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in Annex TBD are fulfilled for a corresponding NR Band for FR1 and FR2, respectively, and

- the conditions of SSB\_RP and SSB Ês/Iot according to Annex TBD for a corresponding NR Band are fulfilled.

Tidentify\_intra\_NR: It is the time to identify the target intra-frequency NR cell and it depends on whether the target NR cell is known cell or unknown cell and on the frequency range (FR) of the target NR cell. If the IAB-MT is not configured with intra-frequency NR carrier for RRC re-establishment then Tidentify\_intra\_NR=0; otherwise Tidentify\_intra\_NR shall not exceed the values defined in Table 12.1.1.1.2.1-1.

Tidentify\_inter\_NR,i: It is the time to identify the target inter-frequency NR cell on inter-frequency carrier *i* configured for RRC re-establishment and it depends on whether the target NR cell is known cell or unknown cell and on the frequency range (FR) of the target NR cell. Tidentify\_inter\_NR,i shall not exceed the values defined in Table 12.1.1.1.2.1-2.

[Editor’s note 1: The description regarding TSMTC and TSMTC,i will be added after RAN4 finalizes the requirements regarding the number of SMTC windows (see editor’s note 2)]

TSI-NR: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 38.331 [15] for the target NR cell.

TPRACH: It is the delay uncertainty in acquiring the first available PRACH occasion in the target NR cell. TPRACH can be up to the summation of SSB to PRACH occasion association period and 10 ms. SSB to PRACH occasion associated period is defined in clause 14 of TS 38.213 [10].

Nfreq: It is the total number of NR frequencies to be monitored for RRC re-establishment; Nfreq = 1 if the target intra-frequency NR cell is known, else Nfreq = 2 and Tidentify\_intra\_NR = 0 if the target inter-frequency NR cell is known.

There is no requirement if the target cell does not contain the IAB-MT context.

In the requirement defined in the below tables, the target FR1 cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown.

[Editor’s Note 2: Requirement that the IAB-MT can be configured up to 4 SMTC windows can be introduced after the IAB-MT capability discussion for this feature is finalized by RAN1. Details of such requirements are FFS.]

Table 12.1.1.1.2.1-1: Time to identify target NR cell for RRC connection re-establishment to NR intra-frequency cell

|  |  |  |
| --- | --- | --- |
| Serving cell SSB Ês/Iot (dB) | Frequency range (FR) of target NR cell | Tidentify\_intra\_NR [ms] |
| Known NR cell | Unknown NR cell |
| ≥ -8 | FR1 | MAX (1600 ms, 5 x TSMTC) | MAX (6400 ms, 10 x TSMTC) |
| ≥ -8 | FR2 | N/A | MAX (8000 ms, 80 x TSMTC)) |
| < -8 | FR1 | N/A | 6400Note1 |
| < -8 | FR2 | N/A | 28160Note1 |
| Note 1: The IAB-MT is not required to successfullyidentify a cell on any NR frequency layer when TSMTC >160 ms and serving cell SSB Ês/Iot < -8 dB. |

Table 12.1.1.1.2.1-2: Time to identify target NR cell for RRC connection re-establishment to NR inter-frequency cell

|  |  |  |
| --- | --- | --- |
| Serving cell SSB Ês/Iot (dB) | Frequency range (FR) of target NR cell | Tidentify\_inter\_NR, i [ms] |
| Known NR cell | Unknown NR cell |
| ≥ -8 | FR1 | MAX (1600 ms, 6 x TSMTC, i) | MAX (6400 ms, 13 x TSMTC, i) |
| ≥ -8 | FR2 | N/A | MAX (8000 ms, 104 x TSMTC, i)) |
| < -8 | FR1 | N/A | 6400Note1 |
| < -8 | FR2 | N/A | 32000Note1 |
| Note 1: The IAB-MT is not required to successfully identify a cell on any NR frequency layer when TSMTC,i >160 ms and serving cell SSB Ês/Iot < -8 dB. |

#### 12.1.1.2 Random access

The requirements in clause 6.2.2 in [6] apply for IAB-MT.

[Editor’s note: The CR can be modified later to align the accuracy requirements for absolute power applied to the first preamble and the relative power applied to the additional preamble with RF’s conclusion.]

#### 12.1.1.3 SA: RRC Connection Release with Redirection

##### 12.1.1.3.1 Introduction

This clause contains requirements on the IAB-MT regarding RRC connection release with redirection procedure. RRC connection release with redirection is initiated by the *RRCRelease* message with redirection to NR from NR specified in TS 38.331 [15]. The RRC connection release with redirection procedure is specified in clause TBD of TS 38.331 [15].

##### 12.1.1.3.2 Requirements

###### 12.1.1.3.2.1 RRC connection release with redirection to NR

The IAB-MT shall be capable of performing the RRC connection release with redirection to the target NR cell within Tconnection\_release\_redirect\_NR.

The time delay (Tconnection\_release\_redirect\_NR) is the time between the end of the last slot containing the RRC command, “*RRCRelease*” (TS 38.331 [15]) on the NR PDSCH and the time the IAB-MT starts to send random access to the target NR cell. The time delay (Tconnection\_release\_redirect\_NR) shall be less than:

 Tconnection\_release\_redirect\_NR = TRRC\_procedure\_delay + Tidentify-NR + TSI-NR + TRACH

The target NR cell shall be considered detetable when for each relevant SSB, the side conditions should be met that,

* the conditions of SSB\_RP and SSB Ês/Iot according to Annex TBD for a corresponding NR Band are fulfilled.

TRRC\_procedure\_delay: It is the RRC procedure delay for processing the received message “*RRCRelease*” as defined in clause TBD of TS 38.331 [15].

Tidentify-NR: It is the time to identify the target NR cell and depends on the frequency range (FR) of the target NR cell. It is defined in Table 12.1.1.3.2-1. Note that Tidentify-NR = TPSS/SSS-sync + Tmeas, in which TPSS/SSS-sync is the cell search time and Tmeas is the measurement time due to cell selection criteria evaluation.

TSI-NR: It is the time required for acquiring all the relevant system information of the target NR cell. This time depends upon whether the IAB-MT is provided with the relevant system information of the target NR cell or not by the old NR cell before the RRC connection is released.

TRACH: It is the delay uncertainty in acquiring the first available PRACH occasion in the target NR cell. TRACH can be up to the summation of SSB to PRACH occasion association period and 10 ms. SSB to PRACH occasion associated period is defined in clause 14 of TS 38.213 [10].

Trs is the SMTC periodicity of the target NR cell if the IAB-MT has been provided with an SMTC configuration for the target cell in the redirection command, otherwise Trs is the SMTC periodicity configured in the *measObjectNR* having the same SSB frequency and subcarrier spacing configured for the RRC connection release with redirection. If the IAB-MT is not provided with SMTC configuration or measurement object for the frequency which is also configured for the RRC connection release with redirection then:

* the requirement in this clause is applied with Trs = 160 ms if the SSB transmission periodicity is not larger than 160 ms; otherwise,
* there is no requirement if the SSB transmission periodicity is larger than 160ms.

Table 12.1.1.3.2-1: Time to identify target NR cell for RRC connection release with redirection to NR

|  |  |
| --- | --- |
| Frequency range (FR) of target NR cell | Tidentify-NR |
| FR1 | MAX (5440 ms, 11×Trs) |
| FR2 | MAX (7040 ms, 8×11×Trs) |

[Editor’s note: The description regarding the relationship between Trs and SMTC configuration will be added after RAN4 finalizes the requirements regarding the number of SMTC windows]

## 12.2 Timing

### 12.2.1 IAB-MT transmit timing

*Editor notes: The terminology of “downlink” and “uplink” could be revised and aligned with RF conclusion.*

#### 12.2.1.1 Introduction

The IAB-MT shall have capability to follow the frame timing change of the reference cell in connected state. The uplink frame transmission takes place before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. IAB-MT initial transmit timing accuracy, gradual timing adjustment requirements are defined in the following requirements.

#### 12.2.1.2 Requirements

The IAB-MT initial transmission timing error shall be less than or equal to ±Te where the timing error limit value Te is specified in Table 12.2.1.2-1. This requirement applies for PUCCH, PUSCH and SRS or it is the PRACH transmission.

The IAB-MT shall meet the Te requirement for an initial transmission provided that at least one SSB is available at the IAB-MT during the last 160 ms. The reference point for the IAB-MT initial transmit timing control requirement shall be the downlink timing of the reference cell minus . The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. *N*TA for PRACH is defined as 0.

 (in *Tc* units) for other channels is the difference between IAB-MT transmission timing and the downlink timing immediately after when the last timing advance in clause 12.2.2 was applied. *N*TA for other channels is not changed until next timing advance is received. The value ofdepends on the duplex mode of the cell in which the uplink transmission takes place and the frequency range (FR). is defined in Table 12.2.1.2-2.

Table 12.2.1.2-1: Te Timing Error Limit

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Range** | **SCS of SSB signals ( kHz)** | **SCS of uplink signals ( kHz)** | **Te** |
| 1 | 15 | 15 | 12\*64\*Tc |
| 30 | 10\*64\*Tc |
| 60 | 10\*64\*Tc |
| 30 | 15 | 8\*64\*Tc |
| 30 | 8\*64\*Tc |
| 60 | 7\*64\*Tc |
| 2 | 120 | 60 | 3.5\*64\*Tc |
| 120 | 3.5\*64\*Tc |
| 240 | 60 | 3\*64\*Tc |
| 120 | 3\*64\*Tc |
| Note 1: Tc is the basic timing unit defined in TS 38.211 [8] |

Table 12.2.1.2-2: The Value of 

|  |  |
| --- | --- |
| Frequency range and band of cell used for uplink transmission | (Unit: TC) |
| FR1 TDD band without LTE-NR coexistence case  | 25600 (Note 1) |
| FR1 TDD band with LTE-NR coexistence case | 39936 (Note 1) |
| FR2 | 13792 |
| Note 1: The IAB-MT identifies  based on the information n-TimingAdvanceOffset as specified in TS 38.331 [15]. If IAB-MT is not provided with the information n-TimingAdvanceOffset, the default value of  is set as 25600 for FR1 band. |

When it is the transmission for PUCCH, PUSCH and SRS transmission, the IAB-MT shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 12.2.3 is applied.

##### 12.2.1.2.1 Gradual timing adjustment

When the transmission timing error between the IAB-MT and the reference timing exceeds ±Te then the IAB-MT is required to adjust its timing to within ±Te. The reference timing shall be  before the downlink timing of the reference cell. All adjustments made to the IAB-MT uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be Tq.

2) The minimum aggregate adjustment rate shall be Tp per second.

3) The maximum aggregate adjustment rate shall be Tq per 200 ms.

where the maximum autonomous time adjustment step Tq and the aggregate adjustment rate Tp are specified in Table 12.2.1.2.1-1.

Table 12.2.1.2.1-1: Tq Maximum Autonomous Time Adjustment Step and Tp Minimum Aggregate Adjustment rate

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency Range | SCS of uplink signals (kHz) | Tq | Tp  |
| 1 | 15 | 5.5\*64\*Tc | 5.5\*64\*Tc |
| 30 | 5.5\*64\*Tc | 5.5\*64\*Tc |
| 60 | 5.5\*64\*Tc | 5.5\*64\*Tc |
| 2 | 60 | 2.5\*64\*Tc | 2.5\*64\*Tc |
| 120 | 2.5\*64\*Tc | 2.5\*64\*Tc |
| NOTE: Tc is the basic timing unit defined in TS 38.211 [8] |

### 12.2.2 IAB-MT timer accuracy

Detailed structure of the subclause is TBD.

Editor’s Note: The need for this requirement is FFS

### 12.2.3 IAB-MT timing advance

The requirements in clause 7.3 in [6] apply for IAB-MT.

[Editor’s notes: The terminology of “downlink” and “uplink” could be revised and aligned with RF conclusion.]

### 12.2.4 Cell phase synchronization accuracy

#### 12.2.4.1 Introduction

Cell phase synchronization accuracy for TDD is defined as the maximum absolute deviation in frame start timing between any pair of cells on the same frequency that have overlapping coverage areas.

#### 12.2.4.2 Requirements

The cell phase synchronization accuracy measured at IAB DU antenna connectors shall be better than 3 µs.

## 12.3 Signalling Characteristics for IAB MTs

### 12.3.1 Radio Link Monitoring

#### 12.3.1.1 Introduction

The UE requirements in sub-clause 8.1.1 [6] apply for IAB-MT.

#### 12.3.1.2 Requirements for SSB based radio link monitoring

Detailed structure of the subclause is TBD.

#### 12.3.1.3 Requirements for CSI-RS based radio link monitoring

Detailed structure of the subclause is TBD.

#### 12.3.1.4 Minimum requirement for IAB-MT turning off the transmitter

Detailed structure of the subclause is TBD.

#### 12.3.1.5 Minimum requirement for L1 indication

Detailed structure of the subclause is TBD.

#### 12.3.1.6 Scheduling availability of IAB-MT during radio link monitoring

Detailed structure of the subclause is TBD.

### 12.3.2 Link Recovery Procedure

#### 12.3.2.1 Introduction

The UE requirements in sub-clause 8.5.1 [6] apply for IAB-MT.

#### 12.3.2.2 Requirements for SSB based beam failure detection

Detailed structure of the subclause is TBD.

#### 12.3.2.3 Requirements for CSI-RS based beam failure detection

Detailed structure of the subclause is TBD.

#### 12.3.2.4 Minimum requirement for L1 indication

Detailed structure of the subclause is TBD.

#### 12.3.2.5 Requirements for SSB based candidate beam detection

##### 12.3.2.5.1 Introduction

The requirements in this clause apply for each SSB resource in the set  configured for a serving cell, provided that the SSBs configured for candidate beam detection are actually transmitted within IAB-MT active DL BWP during the entire evaluation period specified in clause 12.3.2.5.2.

##### 12.3.2.5.2 Minimum requirement

Upon request the IAB-MT shall be able to evaluate whether the L1-RSRP measured on the configured SSB resource in set  estimated over the last TEvaluate\_CBD\_SSB ms period becomes better than the threshold Qin\_LR provided SSB\_RP and SSB Ês/Iot are according to Annex Table in B.2.4.1 [6] for a corresponding band.

The IAB-MT shall monitor the configured SSB resources using the evaluation period in table 12.3.2.5.2-1 and 12.3.2.5.2-2 which is applicable to the non-DRX mode only.

The value of TEvaluate\_CBD\_SSB is defined in Table 12.3.2.5.2-1 for FR1.

The value of TEvaluate\_CBD\_SSB is defined in Table 12.3.2.5.2-2 for FR2 with scaling factor N=[TBD].

Where,

For FR1,

- , when in the monitored cell there are measurement gaps configured for intra-frequency or inter-frequency [or inter-RAT measurements], which are overlapping with some but not all occasions of the SSB,

- P = 1 when in the monitored cell there are no measurement gaps overlapping with any occasion of the SSB.

For FR2,

- , when candidate beam detection RS is not overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TSSB < TSMTCperiod).

- P is Psharing factor , when candidate beam detection RS is not overlapped with measurement gap and candidate beam detection RS is fully overlapped with SMTC period (TSSB = TSMTCperiod).

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TSSB < TSMTCperiod) and SMTC occasion is not overlapped with measurement gap and

- TSMTCperiod ≠ MGRP or

- TSMTCperiod = MGRP and TSSB < 0.5 × TSMTCperiod

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TSSB < TSMTCperiod) and SMTC occasion is not overlapped with measurement gap and TSMTCperiod = MGRP and TSSB = 0.5 × TSMTCperiod

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TSSB < TSMTCperiod) and SMTC occasion is partially or fully overlapped with measurement gap

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is fully overlapped with SMTC occasion (TSSB = TSMTCperiod) and SMTC occasion is partially overlapped with measurement gap (TSMTCperiod < MGRP)

* Psharing factor = 1
* if all of the reference signals configured for CBD outside measurement gap are not fully overlapped by intra-frequency SMTC occasions, or
* if all of the reference signal configured for CBD outside measurement gap and fully-overlapped by intra-frequency SMTC occasions are not overlapped by with the SSB symbols indicated by SSB-ToMeasure and 1 symbol before each consecutive SSB symbols indicated by SSB-ToMeasure and 1 symbol after each consecutive SSB symbols indicated by SSB-ToMeasure, given that SSB-ToMeasure is configured;
* Psharing factor = 3, otherwise.

**Table 12.3.2.5.2-1: Evaluation period TEvaluate\_CBD\_SSB for FR1**

|  |  |
| --- | --- |
| **Configuration** | **TEvaluate\_CBD\_SSB (ms)**  |
| non-DRX | Ceil(3 × P) × TSSB |
| Note: TSSB is the periodicity of SSB in the set .  |

**Table 12.3.2.5.2-2: Evaluation period TEvaluate\_CBD\_SSB for FR2**

|  |  |
| --- | --- |
| **Configuration** | **TEvaluate\_CBD\_SSB (ms)**  |
| non-DRX | Ceil(3 × P × N) × TSSB |
| Note: TSSB is the periodicity of SSB in the set . |

##### 12.3.2.5.3 Measurement restriction for SSB based candidate beam detection

The UE requirements in sub-clause 8.5.5.3 [6] apply for IAB-MT.

#### 12.3.2.6 Requirements for CSI-RS based candidate beam detection

##### 12.3.2.6.1 Introduction

The requirements in this clause apply for each CSI-RS resource in the set  configured for a serving cell, provided that the CSI-RS resources configured for candidate beam detection are actually transmitted within IAB MT active DL BWP during the entire evaluation period specified in clause 12.3.2.6.2.

##### 12.3.2.6.2 Minimum requirement

Upon request the IAB-MT shall be able to evaluate whether the L1-RSRP measured on the configured CSI-RS resource in set  estimated over the last TEvaluate\_CBD\_CSI-RS [ms] period becomes better than the threshold Qin\_LR within TEvaluate\_CBD\_CSI-RS [ms] period provided CSI-RS Ês/Iot is according to Annex Table in B.2.4.2 [6] for a corresponding band.

The UE shall monitor the configured CSI-RS resources using the evaluation period in table 12.3.2.6.2-1 and 12.3.2.6.2-2 which is applicable to the non-DRX mode only.

The value of TEvaluate\_CBD\_CSI-RS is defined in Table 12.3.2.6.2-1 for FR1.

The value of TEvaluate\_CBD\_CSI-RS is defined in Table 12.3.2.6.2-2 for FR2 with scaling factor N=[TBD].

For FR1,

- , when in the monitored cell there are measurement gaps configured for intra-frequency or inter-frequency[ or inter-RAT measurements], which are overlapping with some but not all occasions of the CSI-RS; and

- P = 1 when in the monitored cell there are no measurement gaps overlapping with any occasion of the CSI-RS.

For FR2,

- P = 1, when candidate beam detection RS is not overlapped with measurement gap and also not overlapped with SMTC occasion.

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is not overlapped with SMTC occasion (TCSI-RS < MGRP)

- , when candidate beam detection RS is not overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TCSI-RS < TSMTCperiod).

- P = 3, when candidate beam detection RS is not overlapped with measurement gap and candidate beam detection RS is fully overlapped with SMTC occasion (TCSI-RS = TSMTCperiod).

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TCSI-RS < TSMTCperiod) and SMTC occasion is not overlapped with measurement gap and

- TSMTCperiod ≠ MGRP or

- TSMTCperiod = MGRP and TCSI-RS < 0.5 × TSMTCperiod

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TCSI-RS < TSMTCperiod) and SMTC occasion is not overlapped with measurement gap and TSMTCperiod = MGRP and TCSI-RS = 0.5 × TSMTCperiod

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is partially overlapped with SMTC occasion (TCSI-RS < TSMTCperiod) and SMTC occasion is partially or fully overlapped with measurement gap

- , when candidate beam detection RS is partially overlapped with measurement gap and candidate beam detection RS is fully overlapped with SMTC occasion (TCSI-RS = TSMTCperiod) and SMTC occasion is partially overlapped with measurement gap (TSMTCperiod < MGRP)

Longer evaluation period would be expected if the CSI-RS is on the same OFDM symbols with RLM, BFD, BM-RS, or other CBD-RS, according to the measurement restrictions defined in clause 12.3.2.6.3.

The values of MCBD used in Table 12.3.2.6.2-1 and Table 12.3.2.6.2-2 are defined as

- MCBD = 3, if the CSI-RS resource configured in the set  is transmitted with Density = 3.

**Table 12.3.2.6.2-1: Evaluation period TEvaluate\_CBD\_CSI-RS for FR1**

|  |  |
| --- | --- |
| **Configuration** | **TEvaluateC\_CBD\_CSI-RS (ms)**  |
| non-DRX | Max(25, Ceil(MCBD × P) × TCSI-RS) |
| Note: TCSI-RS is the periodicity of CSI-RS resource in the set .  |

**Table 12.3.2.6.2-2: Evaluation period TEvaluate\_CBD\_CSI-RS for FR2**

|  |  |
| --- | --- |
| **Configuration** | **TEvaluate\_CBD\_CSI-RS (ms)**  |
| non-DRX | Max(25, Ceil(MCBD × P × N) × TCSI-RS) |
| Note: TCSI-RS is the periodicity of CSI-RS resource in the set . |

##### 12.3.2.6.3 Measurement restriction for CSI-RS based candidate beam detection

#### The UE requirements in sub-clause 8.5.6.3 [6] apply for IAB-MT.12.3.2.7 Scheduling availability of IAB-MT during beam failure detection

The UE requirements in sub-clause 8.5.7 [6] apply for IAB-MT.

#### 12.3.2.8 Scheduling availability of IAB-MT during candidate beam detection

The UE requirements in sub-clause 8.5.8 [6] apply for IAB-MT.

--------------------------------------------------End of TP 1------------------------------------------------------