NR NTN Comments file

Template:

# Xnnn

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| Xnnn |  |  |  |  |  |  | vnnn | ToDo |

**[Description]**:

**[Proposed Change]**:

**[Comments]**:

Instructions:

1. Copy the template RIL comments fields above (including the Heading Xnnn)
2. Paste the RIL comments fields at its position while **respecting the order of the RILs in the Review file (i.e. keep the order of the spec).**
3. Fill in the fields, see R19 ASN.1 Guideline.
4. Companies may comment whether they agree or disagree.
5. Can copy spec text and use Word “Track changes”, etc.
6. Do not delete text added by other companies.

# H250

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| H250 | NTN | 1 | Descriptions of UAI | R2-25xxxxx | Huawei (Lili) |  | V006 | ToDo |

**[Description]**: The closest reference location information in the UAI can be used for both SMTC configuration and gap configuration. Besides, it is preferred that we use “reference location information reporting” because it is different from directly reporting UE location. Similar changes (referring to gap configuration) need to be made to multiple other places.

**[Proposed Change]**:

2> if the *assisted-SSB-MTC-Config* is set to *setup*:

3> consider itself to be configured to provide closest reference location information for assisting SMTC and measurement gap configuration in RRC\_CONNECTED state in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide closest reference location information for assisting SMTC and measurement gap configuration in RRC\_CONNECTED state.

**[Comments]**:

# E010

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| E010 | NTN | 2 | Add possibility for*referenceLocationReport* in the *RRCResumeComplete* message | R2-25xxxxx | Ericsson (Philipp) |  | v001 | ToDo |

**[Description]**: The current solution for UE-assisted SMTC selection in RRC\_CONNECTED mode requires two RRC reconfigurations of the UE, for each UE upon each transition to RRC\_CONNECTED mode. This may cause significant signaling overhead and pose a scalability issue for NTN, where cells are large and radio resources are extremely scarce. The additional, second RRC reconfiguration is needed, because at the time when the usual, first RRC reconfiguration is performed, the network does not yet know which are the relevant SMTCs to be configured for the UE.

**[Proposed Change]**: The above problem can be avoided for UEs transitioning from RRC\_INACTIVE to RRC\_CONNECTED mode by allowing the UEs to report the N closest reference locations, i.e., by allowing them to add *referenceLocationReport*, in the *RRCResumeComplete* message based on prior UE configuration. For UEs transitioning from RRC\_INACTIVE to RRC\_CONNECTED mode, AS security is enabled after reception of the *RRCResumeRequest* message by the network. Hence, the *RRCResume* and *RRCResumeComplete* message are subject to the same protection (i.e., cyphering and integrity protection) as the *RRCReconfiguration* and *RRCReconfigurationComplete* message.

This change enables the network to efficiently resume RRC connections of UEs (without RRC reconfiguration).

**[Comments]**:

# E011

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| E011 | NTN | 1 | Establishment/Release of MRBs following the ISA |  | Ericsson (Ignacio) |  | v001 | ToDo |

**[Description]**: Following RAN2 agreements, a UE may initiate the establishment or release when it enters/leaves the ISA of the MBS service in question. However, the text captured in 5.9.3.2 is not sufficient to ensure these limitations. For instance, there are some clauses such as “upon start of the MBS session” that would allow a UE to acquire establish the MRBs even outside the ISA..

**[Proposed Change]**: It is simpler to include the geofencing limitation in the general configuration of broadcast MRBs (section 5.9.3.1) so that it applies both to initial establishment/release but also to updates. Here an example:

#### 5.9.3.1 General

The broadcast MRB configuration procedure is used by the UE to configure PDCP, RLC, MAC and the physical layer upon starting and/or stopping to receive a broadcast MRB transmitted on MTCH, or upon modification of a configuration of a broadcast MRB received by the UE. The procedure applies to MBS capable UEs that are interested to receive or that are receiving an MBS broadcast service that are in RRC\_IDLE, RRC\_INACTIVE or RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceMTCH* or *searchSpaceMCCH* and are located within the Intended Service Area associated with the MBS service, if any.

**[Comments]**:

# E012

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| E012 | NTN | 2 | New RAN1 parameter on DL CE |  | Ericsson (Ignacio) |  | v001 | ToDo |

**[Description]**: RAN1 has updated its higher layer parameters list in . A new parameter for DL CE has been added: searchSpaceLinkingId-r19. Provided there exist an old parameter with the same name but different functionality, we suggest renaming it to *searchSpaceLinkingId-CE-r19.* Unlike RAN1’s proposal, this parameter should be included within SearchSpace IE within a new SearchSpaceExt-v19.

**[Proposed Change]**: Add the new RAN1 parameter with the following TP:

**[Comments]**:

searchSpaceLinkingId-CE-r19 INTEGER (0.. maxNrofSearchSpacesLinks-1-r17) OPTIONAL -- Need R

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| ***SearchSpaceLinkingIdCE***  This parameter is used to link two search spaces of same type in the same BWP. If two search spaces have the same *searchSpaceLinkingIdCE-r19* UE assumes these two search spaces are linked to PDCCH repetition. When PDCCH repetition is monitored in two linked search space (SS) sets, the UE does not expect a third monitored SS set to be linked with any of the two linked SS sets. The two linked SS sets have the same CSS set type other than Type-0 CSS and other than Type-3 CSS for common search spaces other than SearchSpaceZero. The two linked SS sets have the same DCI formats to monitor. For intra-slot PDCCH repetition: The two SS sets should have the same periodicity and offset (monitoringSlotPeriodicityAndOffset), and the same duration. The starting symbol of monitoring occasion of the second SS is located right after the ending symbol of monitoring occasion of the first SS. For linking monitoring occasions across the two SS sets that exist in the same slot: The two SS sets have the same number of monitoring occasions within a slot and n-th monitoring occasion of one SS set is linked to n-th monitoring occasion of the other SS set. |

[vivo] The field naming in the FD part should be ***SearchSpaceLinkingId-CE*.**

# H251

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| H251 | NTN | 1 | SMTC for serving cell | R2-25xxxxx | Huawei (Lili) |  | V006 | ToDo |

**[Description]**: It was agreed to have 7 SMTCs altogether on a single frequency. Serving cell does not require a reference location, and in this case the legacy *smtc* is used for the serving cell measurement. However, this understanding is a bit different from legacy releases because *smtc* is now changed to a cell-specific SMTC rather than a frequency-specific SMTC. Also, the field description of *smtc* related to SMTC adjustment based on PDD needs to revised so that UE does not need to consider neighbour cell propagation delay.

**[Proposed Change]**: Measurement timing configuration for intra-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms for the intra-frequency cells. If the field is broadcast by an NTN cell and *smtc5list* is not configured, the *offset* (derived from parameter *periodicityAndOffset*) is based on the assumption that the gNB-UE propagation delay difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual *offset* based on the actual propagation delay difference. If the field is broadcast by an NTN cell and *smtc5list* is configured, *smtc* is for serving cell measurements and the *offset* (derived from parameter *periodicityAndOffset*) is based on the assumption that the gNB-UE propagation delay difference equals to 0 ms.

**[Comments]**:

# E013

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| E013 | NTN | 2 | Maximum amount of reference locations for location-based SMTC selection | R2-25XXXX | Ericsson (Ignacio) |  | v001 | ToDo |

**[Description]**: Last meeting, RAN2 took the following agreement: “The maximum number configured SMTCs for idle/inactive is 7 and it also includes the SMTC of the serving cell (This updates a previous decision to have a maximum of 6 STMCs)”. In our understanding, the overall sentiment in the last RAN2 meeting is that the network will configure 6 potential neighbour SMTCs and SMTC1 is used for the serving cell. Therefore, the network only needs to configure 6 reference locations, i.e., the serving cell does not need a reference location. RAN2 needs to decide whether a reference location for the serving cell is needed for the purpose of location-based SMTC selection feature.

**[Proposed Change]**: The maximum number of reference locations for location-based SMTC selection is 6. The serving cell, i.e., SMTC1, is excluded from SMTC selection.

**[Comments]**: We understand that the UE needs SMTC1 to keep track of the serving cell which always needs to be measured.

[vivo] We agree with 6 as the max size of the reference location list. In addition, the scenario where there are 7 detectable neighboring cells is not a common case in TN. And we believe this is even less common for the NTN scenario.

# E014

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| E014 | NTN | 1 | Clarificatory NOTE for the use of ISA in both SIB and USD to establish MRBs |  | Ericsson (Ignacio) |  | v001 | ToDo |

**[Description]**: Last meeting, RAN2 agreed to consider the Target Service Area for the purpose of geofencing MBS broadcast services in NTN. Following previous agreements related to the ISA, this information in USD can also be used to establish/release MRBs depending on whether the UE is location within or outside the Target Service Area.

**[Proposed Change]**: Include a general NOTE so that the UE can consider both sources of information to establish/release MRB(s).

**[Comments]**: RAN2 to consider the following TP:

NOTE 2: It is up to UE implementation to use either the Target Service Area in the USD or the ISA(s) in *SIBXX*, if provided, for broadcast MRB configuration in NTN.

[vivo] We think the TSA is only needed for MCCH acquisition. The benefit of considering both resources for MRB management is unclear.

# V200

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V200 | NTN | 1 | Having a valid version of SIB2 when the CONNECTED UE is configured with location information reporting for assisted SMTC configuration | Yes, R2-250xxxx | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: When the CONNECTED UE is configured with location information reporting for assisted SMTC configuration, the network may not configure *refLocList-r19* via dedicated RRC message (for overhead saving), the UE shall have a valid version of SIB2. Otherwise, the UE may not be able to report the nearest location in the RRC complete message.

**[Proposed Change]**: Clarify that the CONNECTED UE is configured with location information reporting for assisted SMTC configuration shall have a valid version of SIB2.

5.2.2.1 General UE requirements

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The UE capable of MBS broadcast which is receiving or interested to receive MBS broadcast service(s) via a broadcast MRB shall ensure having a valid version of *SIB20*, regardless of the RRC state the UE is in.

The UE configured to provide location information for assisted SMTC configuration in RRC\_CONNECTED state shall ensure having a valid version of *SIB2.*

The UE shall ensure having a valid version of the posSIB requested by upper layers.

**[Comments]**:

# V201

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V201 | NTN | 1 | PDCCH repetition impacts on SI acquisition | Yes, R2-250xxxxx | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: With common PDCCH repetition, the UE not only monitors *searchSpaceOtherSystemInformation*, but also monitors *searchSpace* linked with *searchSpaceOtherSystemInformation*. Clarification is needed in sub-clause 5.2.2.3.2

**[Proposed Change]**: Clarify that PDCCH monitoring occasions for SI message are determined based on search space(s) indicated by *searchSpaceOtherSystemInformation* and its linked *searchSpace* (if any) in sub-clause 5.2.2.3.2.

5.2.2.3.2 Acquisition of an SI message

For SI message acquisition PDCCH monitoring occasion(s) are determined according to *searchSpaceOtherSystemInformation* and linked *searchSpace* (if any). If *searchSpaceOtherSystemInformation* or linked *searchSpace* is set to zero, PDCCH monitoring occasions for SI message reception in SI-window are same as PDCCH monitoring occasions for *SIB1* where the mapping between PDCCH monitoring occasions and SSBs is specified in TS 38.213[13]. If *searchSpaceOtherSystemInformation* or linked *searchSpace* (if any) is not set to zero, PDCCH monitoring occasions for SI message are determined based on search space(s) indicated by *searchSpaceOtherSystemInformation* and its linked *searchSpace* (if any). PDCCH monitoring occasions for SI message which are not overlapping with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from one in the SI window. The [x×N+K]th PDCCH monitoring occasion (s) for SI message in SI-window corresponds to the Kth transmitted SSB, where x = 0, 1, ...X-1, K = 1, 2, …N, N is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is equal to CEIL(number of PDCCH monitoring occasions in SI-window/N). The actual transmitted SSBs are sequentially numbered from one in ascending order of their SSB indexes. The UE assumes that, in the SI window, PDCCH for an SI message is transmitted in at least one PDCCH monitoring occasion corresponding to each transmitted SSB and thus the selection of SSB for the reception SI messages is up to UE implementation.

**[Comments]**:

# V202

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V202 | NTN | 1 | Reference to 5.3.5.3 | N | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: The *OtherConfig* setting up location information reporting also impacts sub-clause 5.3.5.3. A reference to sub-clause 5.3.5.3 should be added in sub-clause 5.3.5.9.

**[Proposed Change]**:

1> if the received *otherConfig* includes the *assisted-SSB-MTC-Config*:

2> if the *assisted-SSB-MTC-Config* is set to *setup*:

3> consider itself to be configured to provide location information for assisted SMTC configuration in RRC\_CONNECTED state in accordance with 5.3.5.3 and 5.7.4;

2> else:

3> consider itself not to be configured to provide location information for assisted SMTC configuration in RRC\_CONNECTED state.

**[Comments]**:

# V203

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V203 | NTN | 1 | Refine the mapping between reference location and smtc4 and smtc5 | Yes, R2-250xxxx | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: Currently, the refLocList can only be associated with smtc5. In our understanding, the reference location should be allowed to be associated with smtc4. For example, the network may configure 3 smtc4 and 3 smtc5 of different periodicity, with 6 reference locations. For Rel-19 UE, the UE should know the detailed association between smtc4/smtc5 and the reference location.

**[Proposed Change]**: Refine the mapping between reference location and smtc4 and smtc5

***refLocList***

Indicates a reference location associated to an SMTC configuration in *smtc5list*. If present, it includes the same number of entries as *smtc5list*. The first entry in this list corresponds to the first entry across *smtc4list* and *smtc5list*, the second entry corresponds to the seccond entry across *smtc4list* and *smtc5list*, and so on.

**[Comments]**:

# V204

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V204 | NTN | 2 | SMTC5 and the reference location list can be configured for the inter-frequency case | Yes, R2-250xxxx | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: There are use cases to include SMTC5 and reference location list in SIB4 for the inter-frequency case.

**[Proposed Change]**: Add *refLocList* and *smtc5list* in SIB4.

**[Comments]**:

# V205

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V204 | NTN | 2 | FFS whether also a distance threshold is indicated. | Yes, R2-250xxxx | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: We think a distance threshold is needed for the CONNECTED UE. There is no need for UE to report its location if the distance to the nearest location remains large.

**[Proposed Change]**: Introduce a distance threshold in *Assisted-SSB-MTC-Config*. The UE only sets the reference location bit to 1 when the UE is within the associated threshold range.

**[Comments]**:

# V206

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V207 | NTN | 1 | Need code for *mbs-SessionAreaList-r19* should be Need S | Yes, R2-250xxxxx | vivo (Stephen) |  | v005 | ToDo |

**[Description]**: RAN2 confirms that if no intended area ID is explicitly indicated in MCCH for an MBS broadcast service the UE is interested in, the UE considers the service is applicable for reception within the entire cell area. So Need S is supposed to be used for *mbs-SessionAreaList-r19*

**[Proposed Change]**: Change Need R to Need S for *mbs-SessionAreaList-r19*

**[Comments]**:

# V207

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V206 | NTN | 1 | Capture the following agreement.  RAN2 confirms that if no intended area ID is explicitly indicated in MCCH for an MBS broadcast service the UE is interested in, the UE considers the service is applicable for reception within the entire cell area, with legacy behavior applicable (FFS whether we capture this in the spec) | Yes, R2-250xxxxx | vivo (Stephen) |  | v003 | ToDo |

**[Description]**: The current specification only specifies the following cases: namely, cases where a service is not associated with an ISA entry, and cases where services are associated with an ISA entry with a specific area. The UE's behavior in the case where a service is associated with an empty ISA entry shall be further clarified.

**[Proposed Change]**: Capture the agreement in the FD of mbs-SessionAreaList.

***mbs-SessionAreaList***

Indicates the list of intended service areas associated with an MBS broadcast session in an NTN cell. If absent, UE considers the associated service can be received within the entire cell area.

**[Comments]**: