IoT NTN Comments file

Template:

# Xnnn

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| Xnnn | IoTNTN |  |  |  |  |  | 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.

# V210

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V210 | IoTNTN | 1 | Clarify that PWS is not applicable for NB-IoT TN | N | vivo (Stephen) |  | v003 | ToDo |

**[Description]**: With the removal of the phrase “not applicable for NB-IoT”, this may lead to the understanding that PWS reception is applicable to both NB-IoT NTN and NB-IoT TN. It is not aligned with the current SA1 progress.

**[Proposed Change]**: We suggest using “not applicable for NB-IoT in a TN cell” across sub-clauses 4.4, 5.2.1, and 5.3.2. E.g.,

4.4 Functions

- Including ETWS notification, CMAS notification (not applicable for NB-IoT in a TN cell);

5.2.1.3 System information validity and notification of changes

In RRC\_CONNECTED, BL UEs or UEs inCEor NB-IoT UEs are not required to acquire system information except when T311 is running, or upon handover where the UE is only required to acquire the *MasterInformationBlock* in the target PCell, or for UEs in CE to receive ETWS/CMAS information, or upon expiry of T317 where the UE is required to acquire the *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) and may acquire the *SystemInformationBlockType33* (*SystemInformationBlockType33-NB* in NB-IoT). In RRC\_IDLE, E-UTRAN may notify BL UEs or UEs inCEorNB-IoT UEs about SI update, and except for NB-IoT UEs in a TN cell, ETWS and CMAS notification, and may notify BL UEs or UEs inCE about EAB modification and UAC modification, using Direct Indication information, as specified in 6.6 (or 6.7.5 in NB-IoT) and TS 36.212 [22].

5.3.2.1 General

- to inform UEs in RRC\_IDLE other than NB-IoT UEs in a TN cell, UEs in RRC\_INACTIVE and UEs in RRC\_CONNECTED other than NB-IoT UEs, BL UEs and UEs in CE, about an ETWS primary notification and/ or ETWS secondary notification and/ or;

- to inform UEs in RRC\_IDLE other than NB-IoT UEs in a TN cell, UEs in RRC\_INACTIVE and UEs in RRC\_CONNECTED other than NB-IoT UEs, BL UEs and UEs in CE, about a CMAS notification and/ or;

**[Comments]**:

# V211

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V213 | IoTNTN | 1 | Indicate the regenerative operation mode to NAS | Yes, R2-250xxxx | vivo (Stephen) |  | v003 | ToDo |

[Description]: As per the current spec, when t-ModeSwitching is not configured for the transition from S&F to regenerative, upon the satellite transitions from S&F to regenerative, no mode indication of regenerative mode is indicated to NAS. The NAS may always consider the cell is in S&F mode. It is incorrect.

**[Proposed Change]**: We propose that the RRC of an S&F capable UE shall indicate the cell is operating in regenerative mode if *sf-OperationMode* is not present. Alternatively, *t-ModeSwitching* shall always be configured by the network when the cell is operating in S&F.

**[Comments]**:

# G001

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| G001 | IoTNTN | 1 | Indicate the S&F mode or the normal mode to upper layers |  | Google (Ming-Hung) |  | v005 | ToDo |

**[Description]**: Currently the RRC only indicates to NAS that the cell is operating in S&F mode when *sf-OperationMode* is present; the RRC does not indicate to NAS that the cell is operating in the normal mode when *sf-OperationMode* is absence. Without knowing the cell turning to the normal mode, the NAS layer with a running T3451 timer would refrain the UE from initiating any NAS procedure, which is incorrect and problematic. In addition, when the NAS layer receives an EMM cause#83 (Procedure cannot be completed due to unavailable feeder link while MME is operating in S&F mode), it also needs to check if the cell is operating in the S&F mode to determine whether to trigger an abnormal case.

The current RRC spec places this cross-layer indication under multiple conditions, which we think can be more concise. Besides, for the UE receiving SIB1 in a TN cell, indicating that the cell is operating in the normal mode to the upper layers is definitely not needed. Hence, we propose to place all these cross-layer S&F related indications under the same condition, which is “if the access is for NTN”.

**[Proposed Change]**:

#### 5.2.2.7 Actions upon reception of the *SystemInformationBlockType1* message

[unrelated parts skipped]

1> if the access is for NTN:

2> indicate to upper layers that the cell is operating in Store and Forward mode, if *sf-OperationMode* is present;

2> indicate to upper layers that the cell is operating in normal mode, if *sf-OperationMode* is absent;

1> if in RRC\_CONNECTED while T311 is not running, and the UE supports multi-band cells as defined by bit 31 in *featureGroupIndicators*:

2> disregard the *freqBandIndicator* and *multiBandInfoList*, ifreceived, while in RRC\_CONNECTED;

2> forward the *cellIdentity* to upper layers;

2> forward the *trackingAreaCode* to upper layers;

2> forward the *trackingAreaList* to upper layers, if present;

1> else:

[unrelated parts skipped]

**[Comments]**:

# V212

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V211 | IoTNTN | 1 | Refine the wording of NOTE in sub-clause 5.3.3.3x | N | vivo (Stephen) |  | v003 | ToDo |

**[Description]**: The sentence “*Which procedure (e.g. EDT, random access procedure, CB-Msg3-EDT) is initiated*.” is not complete. The intended UE behavior is unclear.

**[Proposed Change]**: Clarify that which procedure (e.g. EDT, random access procedure, CB-Msg3-EDT) is initiated is up to UE implementation.

5.3.3.3x UE actions upon receiving CB-Msg3-EDT indications from lower layers

For CP transmission using CB-Msg3-EDT, upon indication from lower layers that CB-Msg3-EDT is successfully completed, the UE shall perform the actions as specified in 5.3.3.4b as if an empty *RRCEarlyDataComplete* message was received.

Upon reception of CB-Msg3-EDT failure indication from lower layers, the procedure ends.

NOTE: When receiving the CB-Msg3-EDT failure indication from lower layers, the RRC procedure is re-initiated. Which procedure (e.g. EDT, random access procedure, CB-Msg3-EDT) is initiated is up to UE implementation.

**[Comments]**:

# C001

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| C001 | IoTNTN | 2 | sf-OperationModeNeigh |  | Da Wang |  | V002 | ToDo |

**[Description]**: As we comment during the email discussion, we think the intention of agreement is to add S&F mode and nomal mode indication in SIB33, which doesn’t have the intention to include “barred” and “notBarred” in SIB33. Because currently the barred/notBarred information is not provide from neighbour cell to serving cell.

**[Proposed Change]**:

NeighSatelliteInfo-v19xy ::= SEQUENCE {

sf-OperationModeNeigh-r19 ENUMERATED {s&f, normal} OPTIONAL, -- Need OP

t-ModeSwitchingNeigh-r19 TimeOffsetUTC-r17 OPTIONAL -- Need OR

}

**[Comments]**:

# V213

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V212 | IoTNTN | 1 | Need Code of *sf-OperationModeNeigh-r19* should be Need OR | N | vivo (Stephen) |  | v003 | ToDo |

**[Description]**: The Need OP is not intended for *sf-OperationModeNeigh-r19*, since no specified behavior exists for the absence of the field.

**[Proposed Change]**: Need OR is used for *sf-OperationModeNeigh-r19*.

**[Comments]**:

# V214

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| V214 | IoTNTN | 1 | Clarification on TA report | Yes, R2-250xxxx | vivo (Stephen) |  | v003 | ToDo |

[Description]: Based on the MAC spec, the TA report can be multiplexed into the CB-Msg3 (i.e., there is no limit on the UL multiplexing). The FD of *ta-Report* should be updated to align with the MAC spec.

**[Proposed Change]**: Remove the phrase “Random Access due to” or add the CB-Msg3-EDT. E.g.,

***ta-Report***

When this field is included in *SystemInformationBlockType2*, it indicates reporting of timing advance is enabled during Random Access or CB-Msg3-EDT due to RRC connection establishment, RRC connection resume or RRC connection reestablishment. When this field is included in *MobilityControlInfo*, it indicates TA reporting is enabled during Random Access due to handover, see TS 36.321 [6], clause 5.4.9.

# N011

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| N011 | IoTNTN | 1 | CQI report in CB-Msg3 transmission on the anchor carrier | Yes, R2-250xxxx | Nokia (Ping Yuan) |  | V006 | ToDo |

**[Description]**: Based on current text, for CQI report in CB-Msg3 on the anchor carrier, the latest result is from the carrier where RAR is received. This is not correct for CB-Msg3 where Msg1/Msg2 are skipped.

3> except for CB-Msg3 transmission on the non-anchor carrier, set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the carrier where the random access response is received as specified in TS 36.133 [16]

**[Proposed Change]**: Add a new branch for CQI report in CB-Msg3 to indicate that the carrier is the one UE transmit CB-Msg3 (or monitor CB-Msg4?)

# N012

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| N012 | IoTNTN | 1 | CQI measurement period for the report in CB-Msg3 |  | Nokia (Ping Yuan) |  | V006 | ToDo |

**[Description]**: Based on current text, the CQI measurement use measurement period T1 or T2. However, for CQI report in CB-Msg3, both T1 (before NPRACH transmission) and T2 (from beginning of RAR) are not applicable.

NOTE 0: The downlink channel quality measurements use measurement period T1 or T2, as defined in TS 36.133 [16]

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| --- |
| 36.133 6.6A.2.6  For channel quality reporting in the anchor carrier, the reported NPDCCH repetition level shall be derived from the channel quality measured in the period T1 or T2 in the carrier where the random access response is transmitted, where  - T1 is the period before NPRACH transmission used for NRSRP measurement for enhanced coverage level estimation  - T2 is the period from the beginning of the random access response to the beginning of PUSCH format 1 for DL channel quality reporting.  For channel quality reporting in the non-anchor carrier, the reported NPDCCH repetition level shall be derived from the channel quality measured in the period T2 in the carrier where UE monitors Random Access Response where T2 is defined above. |

**[Proposed Change]**: Clarify the measurement period for CQI report in CB-Msg3 anchor carrier is FFS (up to RAN4 LS response)

# N013

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| N013 | IoTNTN | 1 | Procedure description after CB-Msg3 failure |  | Nokia (Ping Yuan) |  | V006 | ToDo |

**[Description]**: The text below for the procedure after CB-Msg3-EDT failure is not clear. We understand it can be 4-step RACH, 4-step RACH using EDT, and CB-Msg3 EDT. EDT here is confusing since it also uses random access procedure.

NOTE: When receiving the CB-Msg3-EDT failure indication from lower layers, the RRC procedure is re-initiated. Which procedure (e.g. EDT, random access procedure, CB-Msg3-EDT) is initiated

**[Proposed Change]**: change the *EDT* to *EDT using the random access procedure* (as specified in 5.3.3.1b).

# S900

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| S900 | IoTNTN | X | Accumulate SI decoding across SI windows for PWS SIB | Yes, R2-250xxxx | Samsung (Jonas) |  | vXXX | ToDo |

[Description]: Currently, for NB-IoT, the UE can accumulate SI decodings across SI windows in case the UE fails to decode during an SI window:

*1> if the SI message was not possible to decode from the accumulated SI message transmissions by the end of the SI-window, continue reception and accumulation of SI message transmissions on DL-SCH in the next SI-window occasion for the concerned SI message;*

When this feature was introduced in Release 13, it was never considered that an IoT device shall acquire PWS, and since most SIBs use SI notification procedure if the content changes, this is not an issue for non-PWS SIBs. But for PWS, different SIB content i.e via the segments will not trigger the SI notification procedures.

The issue however, is that accumulating across SI windows is a useful feature, in particular for PWS, to increase coverage of PWS notifications for PWS message that are not segmented. So we equally think that there is a risk in completely turning it off in case no segmentation is being performed.

**[Proposed Change]**: Allow the network to configure that the UE shall not accumulate SI decodings across SI windows for PWS SIBs.

**[Comments]**:

# S901

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| RIL Id | WI | Class | Title | Tdoc | Delegate | Misc | File version | Status |
| S901 | IoTNTN | 2 | Clarification on TA report | Yes, R2-250xxxx | Samsung (Jonas) |  | vXXX | ToDo |

[Description]: TA report is according to the RRC procedures applicable for CB-Msg3-EDT (although the field description seems to indicate that it is not applicable to CB-MSg3-EDT).

The CB-Msg3-EDT being applicable to CP solution is likely not an issue as the MAC procedures will not include the TA report if the CB-Msg3 TBS allocation is too small. However, for UP solution, the TA report has higher priority compared to DCCH, meaning that the MAC CE may use unnecessarily occupy data. This is because the *ta-Report* applies to all types of access procedures.

Also, the arguing against this because this was not addressed for PUR is not valid, as the usefulness of PUR in NTN is questionable. CB-Msg3-EDT is introduced specifically for NTN, so it is in our interest to introduce protocols and procedures that make these procedures as efficient as possible.

**[Proposed Change]**: TA report is not triggered for the CB-Msg3-EDT procedures or a *ta-Report* configuration specifically for CB-Msg3-EDT is introduced.

For not triggering the TA report we propose the following:

1> if UE supports timing advance reporting and *ta-Report* is included in *SystemInformationBlockType2* and the UE is not performing CB-Msg3-EDT in accordance with 5.3.3.3b:

2> instruct the associated MAC entity to trigger Timing Advance reporting;

**[Comments]**: