**3GPP TSG RAN WG1 #116 R1-24nnnnn**

**Fukuoka City, Fukuoka, Japan, May 20th—24th, 2024**

**Source: Ad-Hoc Chair (AT&T)**

**Title: Session Notes of AI 8.2.2**

**Agenda Item:** **8.2.2**

**Document for:** **Endorsement**

### 8.2.2 UE features for other Rel-18 work items (Topics B)

*Including UE features for NR MIMO, expanded and improved NR positioning, NES, mobility enhancement, NCR, IoT-NTN, NR-NTN, and BWP without restriction.*

A close up of a box

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| **Rel-18 NR\_BWP\_wor**  **R1-2403832**        Reply LS on BWP operation without bandwidth restriction             RAN4, vivo, Vodafone  Check if RAN1 UE feature update is necessary. |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 53. NR\_BWP\_wor | 53-3 | Support RLM/BM/BFD measurements based on NCD-SSB within active BWP | 1. UE performs RLM/BM/BFD and gapless L3 intra-frequency measurements based on NCD-SSB, where the NCD-SSB is within the active DL BWP.  2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for Scell  3. NCD-SSB within the active DL BWP can be used as the QCL source for other reference signal.  4. UE performs L3 intra-frequency measurements without gaps based on NCD-SSB, where the NCD-SSB is within the active DL BWP. |  | Yes | n/a | UE cannot support RLM/BM/BFD and gapless L3 intra-frequency measurements based on NCD-SSB within active BWP | Per band | No | No | n/a | Note: This FG applies only to PCell and SPCell (if configured)  This FG is not applicable to RedCap or eRedCap UEs. | Optional with capability signalling |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 41. NR\_pos\_enh2 | 41-1-7a | SL PRS measurement for SL-RSTD | 1. Support SL RSTD measurement based on SL-PRS  2. Support SL RSTD measurement reporting  3. Maximum number of SL RSTD measurement reporting for different SL-PRS reception for the same pair of UEs | 41-1-1 | No | No | UE does not support SL PRS measurement for SL-RSTD | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Comp~~o~~onent 3 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7c | SL PRS measurement for UE Rx – Tx time difference without Tx time stamp | 1. Support UE Rx – Tx time difference measurement based on SL PRS  2. Support UE Rx – Tx time difference measurement reporting without Tx time stamp  3. Maximum number of Rx-Tx measurement reporting for different SL-PRS reception for the same pair of UEs~~]~~ | 41-1-1, at least one of 41-1-4a/b/c | No | No | UE does not support SL PRS measurement for Rx – Tx time difference without Tx time stamp | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7d | SL PRS measurement for UE Rx – Tx time difference with Tx time stamp | 1. Support UE Rx – Tx time difference measurement based on SL PRS  2. Support UE Rx – Tx time difference measurement reporting with Tx time stamp  3. Reporting M Rx-Tx measurements for the same SL-PRS transmission (or reception) and different SL-PRS reception (or transmission) for the same pair of UEs  4. Maximum number of Rx-Tx measurement reporting for different SL-PRS reception for the same pair of UEs~~]~~ | 41-1-1, at least one of 41-1-4a/b/c | No | No | UE does not support SL PRS measurement for UE Rx – Tx time difference with Tx time stamp | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values of M={1,2,3,4}  Component 4 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-11 | Finer timing reporting granularity for PRS measurement | Supported ReportingGranularityfactors ~~-1 >=~~ X |  | No | N.A. | Reporting Granularity cannot be signalled | Per band | N.A. | N.A. | N.A. | Component 1 candidate values for X: {-6, -5, -4, -3, -2, -1}  Need for location server to know if the feature is supported | Optional with capability signaling |

**Proposal: Send an LS to RAN2 that for positioning UE feature**

* **A component in a FG without candidate values means that UE shall support it without any additional signalling**
  + **For example, component 8 of FG 41-4-6/7/8 does not need any signaling**
* **Components in a FG with candidate values (i.e. requires capability signaling) should be mandatory**

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 41. NR\_pos\_enh2 | 41-1-3 | Receiving SL-PRS in a dedicated resource pool | 1. Support SL-PRS in dedicated resource pool  2. Support receiving SCI format 1B  3. UE can receive X PSCCH in a slot  4. Supported CP type for 60 kHz SCS | 41-1-1 | Yes | No | Receiving SL-PRS in a dedicated resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {~~[~~floor (NRB /10 RBs), 2\*floor (NRB /10 RBs)~~]~~}  Component 4 candidate values: ~~CP length:~~ {NCP,NCP and ECP}  Note: NRB is the number of RBs defined per channel bandwidth by RAN4 in 38.101-1 Table 5.3.2-1 for FR1 and 38.101-2 Table 5.3.2-1 for FR2 | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-10 | Support of full sensing in a dedicated resource pool | 1. UE can transmit SL-PRS and associated PSCCH using full sensing  2. Support DL pathloss based open loop power control when configured by NR Uu  3. UE can receive X PSCCH in a slot |  | Yes | No | UE cannot transmit SL-PRS using full sensing in a dedicated resource pool | Per band | n/a | n/a | n/a | Component 3 candidate values: {4,8}  Note: Configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: Component 2 is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: UE supporting this FG also support receiving SCI format 1B | Optional with capability signaling |

**Proposal:**

* **Alt. 1**
  + **Introduce the following new row/FG**
  + **Send an LS to RAN2 to inquire on the specification support of higher layer mechanism for a UE to request the SL PRS transmission from another UE**

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| 41. NR\_pos\_enh2 | 41-1-21 | SL-PRS transmission request in physical layer | 1. Support transmitting SL-PRS transmission request via SCI  2. Support receiving SL-PRS transmission request via SCI |  | No | Yes | SL-PRS transmission request in physical layer cannot be signalled | Per band | No | No | No |  | Optional with capability signaling |

* **Alt. 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 41. NR\_pos\_enh2 | 41-1-2 | Receiving SL-PRS in a shared resource pool | 1. Support SL-PRS in shared resource pool  2. Support receiving SCI format 2D | 15-1 41-1-1 | Yes | No | Receiving SL-PRS in a shared resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Note: UE shall also support receiving SL PRS transmission request included SCI format 2D | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-3 | Receiving SL-PRS in a dedicated resource pool | 1. Support SL-PRS in dedicated resource pool  2. Support receiving SCI format 1B  3. UE can receive X PSCCH in a slot  4. Supported CP type for 60 kHz SCS | 41-1-1 | Yes | No | Receiving SL-PRS in a dedicated resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {[floor (NRB /10 RBs), 2\*floor (NRB /10 RBs)]}  Component 4 candidate values: ~~CP length:~~ {NCP,NCP and ECP}  Note: UE shall also support receiving SL PRS transmission request included SCI format 1B | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-4a | Transmitting SL-PRS in a shared resource pool | 1. Support of transmitting SL-PRS in a shared resource pool  2. Support transmitting SCI format 2D | 15-2 or 15-3, 41-1-2 | Yes | No | Transmitting SL-PRS in a shared resource pool is not supported | Per band | n/a | n/a | n/a | The supported resource allocation modes are the same as for communication and signaled in FGs 15-2 and 15-3  Need for location server/UE to know if the feature is supported  Note: UE shall also support sending SL PRS transmission request included SCI format 2D | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-4b | Transmitting SL-PRS mode 1 in a dedicated SL PRS resource pool | 1. UE can transmit SL-PRS and PSCCH within a slot without PSSCH in dedicated SL PRS resource pool  2. UE can transmit SL-PRS according to the mapping rule between PSCCH and SL-PRS  3. Support transmitting SCI format 1B  4. Support receiving DCI format 3\_2  5. Support downlink pathloss based open loop power control of SL-PRS | 41-1-3 | Yes | No | Transmitting SL-PRS mode 1 in a dedicated SL PRS resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported  Note: component 5 is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: UE shall also support sending SL PRS transmission request included SCI format 1B | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-4c | Transmitting SL-PRS mode 2 in a dedicated resource pool | 1. UE can transmit SL-PRS and PSCCH within a slot without PSSCH in dedicated resource pool  2. UE can transmit SL-PRS according to the mapping rule between PSCCH and SL-PRS  3. Support transmitting SCI format 1B | at least one of {41-1-8, 41-1-10} | Yes | No | Transmitting SL-PRS mode 2 in a dedicated resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Note: UE shall also support sending SL PRS transmission request included SCI format 1B | Optional with capability signaling |

**Proposal: Introduce the following new rows/FGs**

* **Alt. 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 41. NR\_pos\_enh2 | 41-1-20a | Supports SL PRS reception for a band configured with SL CA | 1. Support of SL PRS reception for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | One of {41-1-2 or 41-1-3}, 47-v1 | Yes | No | UE does not support SL PRS reception for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-20b | Supports SL PRS tranmsission for a band configured with SL CA | 1. Support of SL PRS transmission for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | One of {41-1-4a, 41-1-4b or 41-1-4c}, 47-v1 | Yes | No | UE does not support SL PRS transmission for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |

* **Alt. 2**

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| 41. NR\_pos\_enh2 | 41-1-20a | SL PRS transmission for a band configured with SL CA | Support SL PRS transmission for a band configured with SL CA | 47-v1 | Yes | Yes | SL PRS transmission for a band configured with SL CA is not supported | Per band | N.A. | N.A. | N.A. | Need for location server/UE to know if the feature is supported.  Note: In a shared SL PRS resource pool in a single SL carrier: Tx power control follows the rule defined for SL CA in NR Rel-18.  Note: In a dedicated SL PRS resource pool in a single SL carrier when the slots (pre)configured for the dedicated SL PRS resource pool do not collide with the slots (pre)configured for any other resource pool or S-SSB resource(s) in other carriers. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-20b | SL PRS reception for a band configured with SL CA | Support SL PRS reception for a band configured with SL CA | 47-v1 | Yes | Yes | SL PRS reception for a band configured with SL CA is not supported | Per band | N.A. | N.A. | N.A. | Need for location server/UE to know if the feature is supported.  Note: In a shared SL PRS resource pool in a single SL carrier: Tx power control follows the rule defined for SL CA in NR Rel-18.  Note: In a dedicated SL PRS resource pool in a single SL carrier when the slots (pre)configured for the dedicated SL PRS resource pool do not collide with the slots (pre)configured for any other resource pool or S-SSB resource(s) in other carriers. | Optional with capability signaling |

* **Alt. 3**

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| 41. NR\_pos\_enh2 | 41-1-xx | Supports SL PRS Rx for a band configured with SL CA | 1. Support of SL PRS reception for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | One of {41-1-2 or 41-1-3}  47-v1 | Yes | No | UE does not support SL PRS reception for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-xx | Supports SL PRS Tx for a band configured with SL CA | 1. Support of SL PRS transmission for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | One of {41-1-4a, 41-1-4b or 41-1-4c}  47-v1 | Yes | No | UE does not support SL PRS transmission for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |

**Proposal: Capture the following FGs in the LTE UE feature list: 41-1-1, 41-1-1a, 41-1-2, 41-1-3, 41-1-4c, 41-1-4d, 41-1-5, 41-1-7x, 41-1-8, 41-1-10, 41-1-11, 41-1-12, 41-1-12, 41-1-13, 41-1-13b, 41-1-14, 41-1-18, 41-1-19, 41-1-20a, 41-1-20b**

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 41. NR\_pos\_enh2 | 41-2-8 | Support to perform ~~legacy~~ DL PRS-RSRP, DL PRSR-RSRPP, DL RSTD measurements inside the indicated time window only for DL TDoA | Support to perform ~~legacy~~ measurements inside the indicated time window only for DL TDoA | 13-3a | No | N/A | The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for ~~legacy~~ PRS measurements for DL TDoA in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window | Per band | No | No | No | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-9 | Support to perform ~~legacy~~ DL PRS-RSRP, DL PRSR-RSRPP, UE Rx-Tx measurements inside the indicated time window only for multi-RTT | Support to perform ~~legacy~~ measurements inside the indicated time window only for multi-RTT | 13-4a | No | N/A | The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for ~~legacy~~ PRS measurements for multi-RTT in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window | Per band | No | No | No | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-10 | Support to perform ~~legacy~~ DL PRS-RSRP, DL PRSR-RSRPP measurements inside the indicated time window only for DL AoD | Support to perform ~~legacy~~ measurements inside the indicated time window only for DL AoD | 13-2a | No | N/A | The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for ~~legacy~~ PRS measurements for DL AoD in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window | Per band | No | No | No | Need for location server to know if the feature is supported | Optional with capability signaling |

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| 41. NR\_pos\_enh2 | 41-3-3 | Support of PRS measurement in RRC\_IDLE | Support of DL PRS measurement in RRC\_IDLE for DL-TDOA and/or DL-AoD ~~Rel. 17 methods~~ the UE supports in RRC\_INACTIVE | 13-1, at least one of {27-18a, 27-18b}, 27-6~~}~~ | No | n/a | PRS measurements in RRC\_IDLE not supported | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling. |

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| 41. NR\_pos\_enh2 | 41-1-4a | Transmitting SL-PRS in a shared resource pool | 1. Support of transmitting SL-PRS in a shared resource pool  2. Support transmitting SCI format 2D | 15-2 or 15-3, 41-1-2 | Yes | No | Transmitting SL-PRS in a shared resource pool is not supported | Per band | n/a | n/a | n/a | The supported resource allocation modes are the same as for communication and signaled in FGs 15-2 and 15-3  Need for location server/UE to know if the feature is supported  Note: If UE indicates support of *p0-OLPC-Sidelink-r17*, the range of P0 values associated with p0-OLPC-Sidelink-r17 is used for SL PRS transmission | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-4b | Transmitting SL-PRS mode 1 in a dedicated SL PRS resource pool | 1. UE can transmit SL-PRS and PSCCH within a slot without PSSCH in dedicated SL PRS resource pool  2. UE can transmit SL-PRS according to the mapping rule between PSCCH and SL-PRS  3. Support transmitting SCI format 1B  4. Support receiving DCI format 3\_2  5. Support downlink pathloss based open loop power control of SL-PRS | 41-1-3 | Yes | No | Transmitting SL-PRS mode 1 in a dedicated SL PRS resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported  Note: component 5 is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: If UE indicates support of *p0-OLPC-Sidelink-r17*, the range of P0 values associated with p0-OLPC-Sidelink-r17 is used for SL PRS transmission | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-17 | Open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated resource pool | Support of open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated resource pool for unicast transmissions | at least one of 41-1-4b or 41-1-4c | Yes | Yes | Open loop SL power control and SL RSRP report for dedicated resource pool is not supported for unicast transmissions | Per band | n/a | n/a | n/a | Note: If UE indicates support of *p0-OLPC-Sidelink-r17*, the range of P0 values associated with p0-OLPC-Sidelink-r17 is used for SL PRS transmission | Optional with capability signaling |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 44. NR\_NTN\_enh | 44-1 | PUCCH repetition on common PUCCH resource | 1. Support repetition transmission of PUCCH for Msg4 HARQ-ACK on common PUCCH resource (i.e., PUCCH resource before dedicated configuration is provided)  2. Support receiving repetition factor in system information  3. Support receiving repetition factor in DCI format 1\_0 with CRC scrambled by TC-RNTI scheduling Msg4 PDSCH  4. Support Msg3 to report capability for PUCCH Msg4 HARQ-ACK repetition  5. Extension of the repetition transmission of PUCCH before dedicated PUCCH resource configuration  6. Support of RSRP threshold for Msg4 HARQ-ACK repetition on common PUCCH resources |  | Yes | No | UE does not support PUCCH repetition for common PUCCH resources | Per Band | N/A | N/A | N/A | A UE that includes LCID codepoint = one of {2, 3, 4, 5, 6, 7} for UL CCCH when the LX field is set to 1 must support FG 44-1  ~~[~~Note: This UE feature group is applicable only for bands in Tables 5.2.2-1 and 5.2.3-1 ~~[TBD for FR2-NTN bands]~~  in TS 38.101-5 ~~[~~and HAPS operation bands in Clause 5.2 of TS 38.104~~]~~ | Optional without capability signaling |

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| **Rel-18 NR\_NTN\_enh**  **R1-2403831**        LS on UE capability for NW verified location         RAN4, Huawei  To be further discussed under agenda item 8.2.2 for any necessary changes to Rel-18 UE features.  **Relevant tdoc(s)**  R1-2404952        Discussion on the LS on UE capability for NW verified location    Huawei, HiSilicon |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 44. NR\_NTN\_enh | 44-3 | UE Rx-Tx Measurement and Report for Multi-RTT with single satellite in NTN | 1. Support UE Rx-Tx time difference and UE Rx-Tx time difference offset measurement based on single sample and report for Multi-RTT positioning with single satellite in NTN  2. Support of reporting DL timing drift due to Doppler over the service link associated with the UE Rx-Tx time difference measurement period | 13-4, 13-8 | No | No | UE does not support Multi-RTT positioning with single satellite in NTN | Per Band | N/A | N/A | N/A | Note: This UE feature group is applicable only for bands in Tables 5.2.2-1 and 5.2.3-1 ~~[TBD for FR2-NTN bands]~~ in TS 38.101-5  Need for location server to know if the feature is supported | Optional with capability signaling |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 2. IoT\_NTN\_enh | 2-4a | GNSS position fix in RRC Connected state for eMTC—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger  2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete and RRCConnectionReconfigurationComplete for HO case  3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | ~~[Rel. 18 2-3a]~~ Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-4b | GNSS position fix in RRC Connected state for NB-IoT—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger  2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete-NB  3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | ~~[Rel. 18 2-3b],~~ Rel. 17 2-1b |  |  | Release 18 NB-IoT UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX | Optional with capability signalling |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. IoT\_NTN\_enh | 2-4a | GNSS position fix in RRC Connected state for eMTC—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger  1.1 In RRC connected-mode, the UE starts with an ‘Autonomous’ GNSS timer-based acquisition starting the autonomous timer-based GNSS measurement gap upon the expiry of its GNSS-ValidityDuration plus ul-TransmissionExtensionValue(if configured), unless an 'Aperiodic GNSS trigger command' is received after at least 5 seconds have elapsed since the UE reported the GNSS-ValidityDuration  2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete and RRCConnectionReconfigurationComplete for HO case  3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | [Rel. 18 2-3a] Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-4b | GNSS position fix in RRC Connected state for NB-IoT—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger  1.1 In RRC connected-mode, the UE starts with an ‘Autonomous’ GNSS timer-based acquisition starting the autonomous timer-based GNSS measurement gap upon the expiry of its GNSS-ValidityDuration plus ul-TransmissionExtensionValue(if configured), unless an 'Aperiodic GNSS trigger command' is received after at least 5 seconds have elapsed since the UE reported the GNSS-ValidityDuration  2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete-NB  3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | [Rel. 18 2-3b], Rel. 17 2-1b |  |  | Release 18 NB-IoT UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX | Optional with capability signalling |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 2. IoT\_NTN\_enh | 2-1g-2 | Dynamic HARQ feedback disabling by DCI-based overridden indication for NB-IoT in multi TB case | 1. UE receives DCI indication to override RRC configuration for disabling HARQ feedback  2. For ~~single~~ multi TB ~~scheduled~~ scheduling a single transport block by single DCI, UE follows NPDCCH monitoring behavior for a HARQ process configured as HARQ feedback disabled by per-HARQ process bitmap signaling and further reversed to HARQ feedback enabled by DCI | At least one of {Rel-16 2-6, 2-7},  Rel. 17 2-1b,  Rel-18 2-1e-2, 2-1f-2 | Yes | N/A | Release 18 NB-IoT UE cannot disable HARQ feedback in multi TB case | Per UE | No | No | Note: this applies to multi-TB case | Optional with capability signalling |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. IoT\_NTN\_enh | 2-2a | ~~NGSO~~Scenario for HARQ disabling for eMTC | Support of NGSO or GSO for HARQ disabling for eMTC | At least one of 2-1a-1  2-1b-1  2-1c-1  2-1a-2  2-1b-2  2-1c-2  2-1d-1  2-1d-2  2-2 | Yes | N/A | NGSO is not supported for HARQ disabling for eMTC | Per UE | No | No | Component value: {gso, ngso}  Note: if the field is absent, both GSO and NGSO are supported  Note: ntn-ScenarioSupport-r17 is not applicable. | Optional with capability signaling |
| 2. IoT\_NTN\_enh | 2-2b | ~~NGSO~~Scenario for HARQ disabling for NB-IoT | Support of NGSO or GSO for HARQ disabling for NB-IoT | At least one of 2-1e-1  2-1f-1  2-1g-1  2-1e-2  2-1f-2  2-1g-2 | Yes | N/A | NGSO is not supported for HARQ disabling for NB-IoT | Per UE | No | No | Component value: {gso, ngso}  Note: if the field is absent, both GSO and NGSO are supported  Note: ntn-ScenarioSupport-r17 is not applicable. | Optional with capability signaling |
| 2. IoT\_NTN\_enh | 2-6a | ~~NGSO~~Scenario for GNSS enhancements for eMTC | Support of NGSO or GSO for GNSS enhancements for eMTC | At least one of 2-3a, 2-4a, 2-5a | Yes | N/A | NGSO for GNSS enhancements for eMTC is not supported | Per UE | No | No | Component value: {gso, ngso}  Note: if the field is absent, both GSO and NGSO are supported  Note: ntn-ScenarioSupport-r17 is not applicable. | Optional with capability signaling |
| 2. IoT\_NTN\_enh | 2-6b | ~~NGSO~~Scenario for GNSS enhancements for NB-IoT | Support of NGSO or GSO for GNSS enhancements for NB-IoT | At least one of 2-3b, 2-4b, 2-5b | Yes | N/A | NGSO for GNSS enhancements for NB-IoT is not supported | Per UE | No | No | Component value: {gso, ngso}  Note: if the field is absent, both GSO and NGSO are supported  Note: ntn-ScenarioSupport-r17 is not applicable. | Optional with capability signaling |

[R1-2403919](file:///Users/Docs/R1-2403919.zip) UE features for other Rel-18 work items (Topics B) Huawei, HiSilicon

[R1-2403972](file:///Users/Docs/R1-2403972.zip) UE features for Rel-18 Work Items (Topics B) Intel Corporation

[R1-2404102](file:///Users/Docs/R1-2404102.zip) UE features for other Rel-18 work items (Topics B) Samsung

[R1-2404164](file:///Users/Docs/R1-2404164.zip) Discussion on Rel-18 UE features topics B (Positioning) vivo

[R1-2404271](file:///Users/Docs/R1-2404271.zip) Discussion on UE Feature Topics B Apple

[R1-2404383](file:///Users/Docs/R1-2404383.zip) Remaining issues on UE features for expanded and improved NR positioning CATT

[R1-2404485](file:///Users/Docs/R1-2404485.zip) UE Features for Other Topics B (MIMO, Pos, NES, MobEnh, IoT-NTN, NR-NTN) Nokia

[R1-2404824](file:///Users/Docs/R1-2404824.zip) UE features for other Rel-18 work items (Topics B) OPPO

[R1-2404887](file:///Users/Docs/R1-2404887.zip) Discussion on UE features for NES LG Electronics

[R1-2404910](file:///Users/Docs/R1-2404910.zip) Discussion on BWP Without Restriction maintenance Vodafone

[R1-2405004](file:///Users/Docs/R1-2405004.zip) UE features for other Rel-18 work items (Topics B) ZTE

[R1-2405029](file:///Users/Docs/R1-2405029.zip) Discussion on UE features for other Rel-18 work items (Topics B) NTT DOCOMO, INC.

[R1-2405104](file:///Users/Docs/R1-2405104.zip) Rel-18 UE features topics set B Ericsson

[R1-2405142](file:///Users/Docs/R1-2405142.zip) UE features for other Rel-18 work items (Topics B) Qualcomm Incorporated