**3GPP TSG RAN meeting #104 RP-240921**

**Shanghai, China, June 17-20, 2024**

## Status Report to TSG

**Agenda item:** 9.4.2.4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** | Rel-18 NR NTN (Non-Terrestrial Networks) enhancements | | | | |
| included in this status report | Study Item:  No | Study Item:  No | Study Item:  No | | Study Item:  No |
| **Acronym** | NR-NTN-enh | | | | |
| **Unique ID** | 941006 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-232669 | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item: | Core part: 06/2024 | Performance part: 06/2024 | Testing part: | |
| **Overall Completion level** | Study Item: | Core part:  Overall: 100%  RAN1: 100%  RAN2: 100%  RAN3: 100%  RAN4: 100% | Performance Part:  Overall: 100%  RAN4: 100% | Testing part: | |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |  |
| --- | --- | --- |
| **Leading WG** | | RAN2 |
| **Rapporteur** | **Name** | Nicolas Chuberre |
| **Company** | Thales |
| **Email** | Nicolas.chuberre@thalesaleniaspace.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.  
 One time unit (TU) corresponds to ~ 2 hours in the meeting.  
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.  
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

#### 2.1.2 Remaining Open issues

## 2.2 RAN2

#### 2.2.1 Agreements

#### 2.2.2 Remaining Open issues

## 2.3 RAN3

#### Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

* **RAN4#110bis meeting**

**Rel-18 NTN UE RF requirements**

**Issue 1-1: Maximum TRP**

**Online Agreement:**

* For type 1 and type 4 with mechanical steering antenna (e.g. parabolic antenna)
  + 35dBm
* For type 2,3, 5 with electronic steering antenna (e.g. phase antenna array)
  + 35dBm, 40dBm or 45dBm for further decision in this meeting.

**Offline agreement:**

For maximum TRP:

* For type 2,3, 5 with electronic steering antenna (e.g. phase antenna array)
  + [43dBm] for further ACLR evaluation; if there is coexistence issue identified for 43dBm next meeting, then set 40dBm as maximum TRP power;
  + The maximum EIRP 76.2 is not changed, the antenna gain for other TRP values could further adjusted;

**Offline agreement:**

For the minimum peak EIRP requirement:

* To state in RAN4 spec to declare the supported elevation angles to comply the minimum peak EIRP requirement and leave the test for RAN5 discussion.

**Issue 1-3: Transmit ON-OFF power**

* **Recommended for further discussion:** 
  + Option 1: reusing FR2 BS OFF power requirement -36dBm/MHz

**Online Agreement:**

* Agree on Option 1.

**Issue 1-4: Transmit ON-OFF time mask**

**Online Agreement:**

* Transient period for FR2-NTN is 5us.

**Issue 1-7: SEM**

**Online Agreement:**

* Agree on proposal 4.
  + FFS on definition of P\_(rated,UE)

**Offline agreement for NS indication for regional requirements**

**Step 1: to make the regulatory requirement clear and applicable to which bands;**

**Step 2: to further discuss how to arrange the regulatory requirement in the specification next meeting;**

**Issue 1-8: Power control requirement**

**Online Agreement:**

* No requirement for power control for Ka band for NR-NTN UE

**Issue 1-9: MPR requirement for type 2 and type 5 to meet OFF-axis EIRP requirement**

Offline agreement:

For type 2 an type 5, the power reduction for OFF-axis EIRP requirement might be needed and the exact value is left for the implementation;

**Issue 2-1 Minimum EIS requirement**

**Online Agreement:**

* for type 3 UE, to specify minimum EIS as -115.6dBm for 50MHz, for the other channel bandwidth, the corresponding EIS requirement could be scaled with PRB based compared with 50MHz;
* for type 1/2/4/5 UE, to specify minimum EIS as -122dBm for 50MHz, for the other channel bandwidth, the corresponding EIS requirement could be scaled with PRB based compared with 50MHz

**Issue 2-2: Maximum input power**

**Online Agreement:**

* For type 3,
  + [-101]dBm as maximum input power with 64QAM
* For type 1/2/4/5:
  + -109.6dBm with 16QAM or [64QAM].
  + FFS for QPSK
* The exact MCS or coding rate for FRC of maximum input power need further discussion and confirmation.

**Issue 2-5: Polarization characteristics**

**Online Agreement:**

* Either RHCP or LHCP is supported by Ka band VSAT in Rel-18

**Issue 1-7: SEM**

**Online Agreement:**

* Agree on proposal 4.
  + FFS on definition of P\_(rated,UE)
  + FFS for the boundary for SEM and spurious emission requirements.

**NR\_NTN\_enh\_SAN\_UE\_demod**

**Issue 1-1: Doppler Spread for both UL and DL**

* Agreement
  + 1200Hz

**Issue 2-1: PDSCH demodulation requirements for above 10 GHz bands**

* Agreement:

|  |  |  |
| --- | --- | --- |
| **Prop. Channel** | **MCS** | **HARQ Config** |
| NTN-TDLC5-1200 | MCS4 | Disabled HARQ (4/16) |
| MCS4 | 16 HARQ Proc |
| NTN-TDLC5-1200 | MCS4 | 32 HARQ Proc |
| MCS13 | 16 HARQ Proc |

**Issue 2-2: How to define requirements for GSO and NGSO for above 10 GHz bands**

* Agreement
  + Define one set of performance requirements for both NGSO and GSO
    - Only consider K\_offset = [8] that corresponding to 64 slots for 120kHz SCS

**Issue 2-3: PDCCH demodulation requirements for above 10 GHz bands**

* Agreement
* AL8 and AL16, with the following test configurations

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Case** | **Bandwidth (MHz)** | **SCS (kHz)** | **CORESET RB** | **CORESET duration** | **Aggregation level** | **CCE to REG mapping type** | **REG bundle size** | **Interleaver size** | **Shift index** | **DCI format** | **Payload (without CRC)** |
| 1 | 200 | 120 | 60 | 1 | 8 | Interleaved | 2 | 3 | 0 | [1-0] | [40] |
| 2 | 200 | 120 | 60 | 2 | 16 | Interleaved | 2 | 3 | 0 | [1-1] | [56] |

**Issue 2-4: Antenna configuration**

* Agreement
  + 1Tx1Rx

**Issue 2-5: Applicability rule**

* Agreement
  + All demodulation performance requirements for NTN enhancements are applicable for Type 1 fixed and Type 2 mobile VSAT UEs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE feature/capability [TBD]** | **Test type** | | **Test list** | **Applicability notes** |
| NR NTN access (nonTerrestrialNetwork-r17) | FR2-NTN | PDSCH | Clause x (Testxx) |  |
| PDCCH | Clause y (Test 1, Test 2) |
| Increasing the number of HARQ processes (max-HARQ-ProcessNumber-r17) | FR2-NTN | PDSCH | Clause x (Testxx) |  |
| Disabled HARQ feedback for downlink transmission (harq-FeedbackDisabled-r17) | FR2-NTN | PDSCH | Clause x (Testxx) |  |

**Issue 3-1-1: MCS**

* Agreement
  + MCS 2 and [MCS 12]

**Issue 3-1-2: PTRS configuration**

* Agreement
  + Not configure PTRS for test with MCS 2 and [MCS12]

**Issue 3-2-1: UCI info**

* Agreement
  + The UCI information can include both ACK/NACK and CSI part 1 for specifying PUCCH UCI BLER performance requirement.

**Issue 3-2-2: Additional DMRS configuration for PUCCH format 3/4**

* Agreement
  + Define PUCCH format 3/4 requirements with additional DMRS configuration both enabled and disabled.
  + Reuse the applicability of requirements for different configurations in section 8.1.2.3.4 of TS 38.181

**Issue 3-3-1: RB assignment**

* Agreement
  + 6RBs in the middle of the test bandwidth for both 15KHz and 30KHz

**Issue 3-3-2: PUSCH aggregation factor**

* Agreement
  + n4 for 15kHz SCS
  + n8 for 30kHz SCS

**Issue 3-3-3: pusch-TimeDomainWindowLength**

* Agreement
  + 4 for 15kHz SCS
  + 8 for 30kHz SCS

**NR\_NTN\_enh\_Part3**

**Issue 1-1: NTN VSAT UE ACS**

Agreement:

1. The summary of co-existence study results of VSAT UE ACS will be capture in TR 38.863 Chapter 6. The suggested ACS value for UE could be different and captured in Chapter 8 with some notes elaborating reasons.
2. NTN VSAT UE ACS value is 25dBc.

**Issue 1-3: Notes 1&2 in R4-2403092**

Agreement:

1. Keep Note 1 and Note 2 only in TR 38.863 for 17(DL)/27(UL) GHz.
2. The conclusion on the ACLR and ACS values for NTN SAN and VSAT UE in the table below are applicable for 17(DL)/27(UL) GHz only.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | SAN | | UE | |
| GEO | LEO | Fixed | Mobile |
| ACLR (dBc) | 12 | 12 | 14 | 14 |
| ACS (dBc) | 18 | 24 | 251, 2, 3 | 251, 2, 3 |
| NOTE 1: At the time of this 3GPP co-existence study, there is no TN band defined or planned near 17 GHz. The parameters are derived based on 3GPP coexistence scenarios in which a TN system is simulated to be operating in the band directly adjacent to the proposed NTN system as well as technical assumptions that may or may not be applicable in practice. The results of the study are not intended to address coexistence issues from a regulatory standpoint.  NOTE 2:   There are existing non-3GPP VSAT UE operating in Ka band at present and will likely continue operating in the future, with ACS performance lower than the value.  NOTE 3:    Additional solutions could be further considered to address coexistence issues if and when TN is deployed in 17 GHz. | | | | |

**RRM requirements for NR\_NTN\_enh**

**Issue 1-6A: Te\_NTN for 60kHz and 120kHz in Case2**

**Agreement: (ad-hoc)**

* Further check and come back in next meeting

**Issue 1-6B: Te\_NTN for 60kHz and 120kHz in Case3**

**Agreement: (ad-hoc)**

* In Case-3, Te\_NTN [Ts] for 120kHz UL SCS is:
  + [10]

<Note: No update was made compared RAN4#110 agreement>

**Issue 3-2: Measurement period and accuracy requirements on RTD**

**Agreement (online):**

* Remove factors related to multiple positioning frequency layers, multiple RX TEGs and Rx beam sweeping from the Rx-Tx requirements.
* Remove the below applicability rules from UE RX-TX time difference measurements:
  + FFS: When a serving cell change occurs during the measurement period, the UE shall continue and complete the UE Rx-Tx time difference measurement provided that the serving cell change does not impact SRS configuration for the UE Rx-Tx time difference measurement.
  + If UE uplink transmission timing changes due to the UE autonomous timing adjustment defined in clause 7.1C.2 during the UE Rx-Tx measurement period, then:
    - UE Rx-Tx measurement period requirements in this clause shall not apply for a cell, which is not the downlink reference cell (defined in section 7.1C.1) for SRS transmission. The UE Rx-Tx time difference measurement period may be restarted in such case.
* Supporting Nsample = 1 is a component of NW verified location (FG 44-2), and it does not require UE to support reduced sample number for TN positioning measurement (FG 27-3-1).
  + HW to draft the LS to RAN1/2 about the information

**Issue 3-5: Other impact on RRM**

**Agreement (online):**

* When UE switches to a new satellite switch with same PCI (through HO, CHO or satellite switch with re-sync for both hard and soft satellite switch), select one option from:
  + Option 1a: UE stops the PRS measurement after t\_service and restart the UE Rx-Tx time difference measurement after switch is complete.
    - The PRS configuration of the two satellites with the same PCI follows RAN1/2 specficiaton, and no further restriction for gNB/LMF to be defined in RAN4.
    - The UE measurement accuracy requiremet does not apply if the PRS transmission from two satelliates overlap in time/frequency domain. Further clarify the definition of “overlapping” offline.
  + Option 1b: UE stops the PRS measurement after t\_servicestart and restart the UE Rx-Tx time difference measurement after switch is complete.
    - The PRS configuration of the two satellites with the same PCI follows RAN1/2 specficiaton, and no further restriction for gNB/LMF to be defined in RAN4.
  + Option 2: UE stops the PRS measurement after t\_service and until LMF triggers new measurement.

**Issue 5-2-S: Soft’ Satellite switch (5-2-S1 and -S2 from RAN4#110 are merged)**

**Agreement (online):**

* Scheduling restrictions over [t-ServiceStart ~ t-Service] for UE incapable of parallelMeasurementWithoutRestriction-r17 and/or [differentSCS between SSB and data]
  + Define scheduling restriction during soft satellite switch from UE perspective, i.e. scheduling restriction are allowed only during SSB occasions of the target satellite (same as 9.2C.5.3)
    - For the scheduling restriction: For RSRP measurement, 1 additional symbol before and after SSB block. For RSRQ measurement, 1 additional symbol before and after RSSI symbols.

**Agreement (online):**

* Optimization on measurements
  + UE is allowed to skip measurements other cells and satellites than the target satellite and source satellite from T-serviceStart to the satellite switch completion.

**Agreement (online):**

* Impact on inter-satellite neighbour cell measurements
  + No optimization for the scenario of ‘(both hard and soft) satellite switch with re-sync’ on inter-satellite neighbor cell measurements

**Issue 6-2: Above 10 GHz, Test case list**

**Agreement: (ad-hoc)**

* Define test cases for the below cases for both Type 1 and Type 2 UEs. Detailed configurations are to be discussed separately.
  + UL timing accuracy
  + Mobility in RRC Idle/Inactive mode
  + Mobility in RRC Connected mode
    - Intra-satellite
    - Inter-satellite (blind mobility)
  + RLM
  + L1-RSRP
  + L3 measurements
  + Measurement accuracy
    - If measurement accuracy requirements specified in Rel-18

**Issue 6-2-2: Above 10 GHz, Rx beam gain**

**Agreement: (ad-hoc)**

* FFS whether the RF margin for different RX beams in existing TN FR2-1 intra-frequency relative accuracy requirements can be removed or not
* Existing absolute measurement accuracy requirement of TN FR2 (including intra-frequency and inter-frequency) can be applied for NTN UE above 10GHz.
* Further discuss the minimum SSB\_RP condition on accuracy requirements

**Issue 6-2-3: Above 10 GHz, UL timing accuracy**

**Agreement: (ad-hoc)**

* Define UL timing test cases at least for following configuration:
  + UL SCS 120kHz with DL SSB SCS: 120kHz
* FFS whether any other configuration need to be considered or not
* For UL SCS is 120kHz,
  + Transmit Timing Test covering
    - Case 1,2,3
  + Timing advance adjustment accuracy covering
    - Case 1,2,3
* Note:
  + Case-1: Stationary UE for GSO
  + Case-2: Stationary UE for LEO
  + Case-3: Mobile UE for GSO

**Issue 6-3-1: Below 10 GHz, Test set-up and applicability rule**

**Agreement: (ad-hoc)**

* NTN-TN inter-frequency cell reselection (Intra-RAT to NR TN and Inter-RAT to LTE TN)
  + For earth-moving cell, time-/location-based measurement initiation for cell reselection:
    - No test case
  + For earth fixed cell:
    - Define test cases
* NTN to NTN time-based measurement initiation for cell reselection in earth-moving cell
  + Not define test case
* NTN to NTN location-based measurement initiation for cell reselection in earth-moving cell
  + Not define test case

**Agreement: (online)**

* Define two TCs:
  + RACH-less for soft satellite switch
  + RACH-based for hard satellite switch
* **RAN4#111 meeting**

**Rel-18 NTN UE RF requirements**

**Issue 1-0: Maximum EIRP**

Agreement:

* Note: Maximum EIRP is defined using 13 PRBs allocation with 120KHz SCS.

**Issue 1-1: Maximum TRP**

Agreement:

* 43dBm for type 2 and type 5, and max EIRP and off-axis EIRP requirements CANNOT be relaxed
* 43dBm for type 3 if max EIRP requirements CANNOT be relaxed

**Issue 1-2: Power backoff for type 2 and type 5 with phase array to meet OFF-axis requirement for GSO orbit**

**Agreement:**

* Add the NOTE in the VSAT class table
* Note X: UE may need power reduction for meeting OFF-axis EIRP requirement defined in clause 9.2.2. Value is implementation dependent.

**Issue 1-3: TRPmax**

**Agreement:**

* To update TRPmax in the emission requirements with TRPrated which is the declared rated output power lower than TRPmax specified in clause 9.2.1.

**Issue 1-4: Number of VSAT simultaneously transmitting, N**

**Agreement:**

* Clarify that the number of VSAT simultaneously transmitting N shall be declared by the VSAT manufacturer.

**Issue 1-5: the clarification of “uncoordinated” from the additional Off-axis EIRP density requirements for protection of fixed services (sub-clause 9.2.2.3.3)**

**Agreement:**

* remove the uncoordinated in the specification

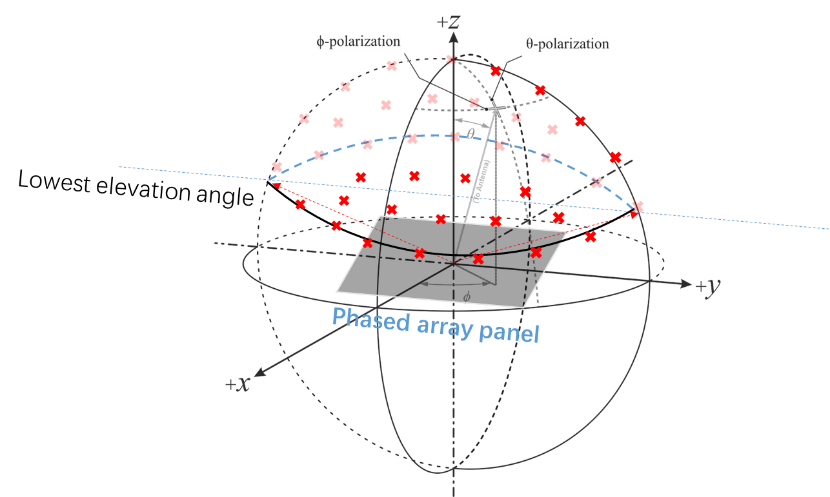
**Issue 1-6: NS value for FR2 NTN bands**

**Agreement:**

* For band n512, to use the NS approach to define the regional requirements;
* For band n511 and n510, not to define the NS values;

**Issue 1-7: Beam steering range and test direction to fulfill minimum EIRP requirement.**

**Agreement:**

* [For measurement metric for min peak EIRP , the min peak EIRP should be verified between the declared supported lowest transmitter elevation angles (as shown in Figure 1-3). ]
* **Figure 1-3** example measurement grid for min peak EIRP of the supported elevation angle
* 

**Issue 1-8: On-axis cross polarization isolation requirements VS Pointing accuracy requirements in clause 9.6.1**

**Agreement:**

* For the type 3 VSAT, linear polarization requirement is not applicable
* For the type 1/2/4/5, both linear and circular polarization requirement are applicable.

**Issue 1-9: Off-Axis EIRP**

**Agreement:**

* ”Off-axis EIRP should” be ”Off-axis EIRP emission density limit within the operating band”

**Issue 1-10: Fixed VSAT Off-axis EIRP requirements for n512**

* Proposal 1 ([R4-2409758](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409758.zip)):
  + For co-polarized transmissions, the requirements specified in table 9.2.2.3.1-1 apply to Fixed VSAT type 1 or 2 when transmitting towards GSO. [THALES, Ericsson]
  + For cross-polarized transmissions, the requirements specified in table 9.2.2.3.1-2 apply to Fixed VSAT type 1 or 2 when transmitting towards GSO. [THALES, Ericsson]

**Agreement:**

* Proposal 1 is agreeable.

**Issue 2-1 Minimum EIS requirement**

Agreement:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10.3.2 Minimum requirement The throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channels as [specified in Annexes A.2.3.2 and A.3.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD for the DL-signal as described in Annex A.5.2.1) with peak reference sensitivity specified in Table 10.3.2-1. And EISREFSENS\_50M declared by the vendor is an integer value in the range specified in Table 10.3.2-2 for different types of NTN VSAT]. The requirement is verified with the test metric of EIS (Link=RX beam peak direction, Meas=Link Angle).  Table 10.3.2-1: OTA reference sensitivity requirement for NTN VSAT   |  |  |  | | --- | --- | --- | | NTN VSAT channel bandwidth (MHz) | UL/DL RB allocation | OTA reference sensitivity level, EISREFSENS  (dBm) | | 50, 100, 200, 400 | Full RB allocation NRB as specified in clause 5.3.2 | EISREFSENS\_50MHz + 10log10(NRB x SCS x 12 / factor)  (NOTE 1) | | NOTE 1: The “factor” represents the normalized factor to scale EIS for different (Channel bandwidth, SCS) configurations. The value of factor is 66 RBs x 60 kHz SCS x 12, i.e. 47520 kHz. | | |   Table 10.3.2-2: The range of EISREFSENS\_50MHz declared by vendor per NTN VSAT   |  |  |  |  | | --- | --- | --- | --- | | Operating band | *NTN VSAT class* | *NTN VSAT type* | The range of EISREFSENS\_50MHz  (dBm) | | n512, n511 | Fixed VSAT | 1, 2 | ≤ -122 | | 3 | ≤ -115.6 | | n512, n511, n510 | Mobile VSAT | 4, 5 | ≤ -122 | |

**Issue 2-2: Maximum input power**

**Agreement:**

* + For type 1/2/3,
* -101dBm as maximum input power with 64QAM
  + For type 4/5:
* -109.6dBm with 16QAM and [64QAM ].
  + For MCS for 64QAM
* Please check the MCS in [R4-2409618](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409618.zip).

**Issue 2-3: ACS**

**Agreement:**

For type 1/2/4/5/3, to define the following requirements;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Rx Parameter | Units | Channel bandwidth | | | |
|  |  | 50 MHz | 100 MHz | 200 MHz | 400 MHz |
| Power in Transmission Bandwidth Configuration | dBm | EISREFSENS\_50M + 6 dB + 10log10(NRB x SCS x 12 / factor) | | | |
| PInterferer for band n512, n511, n510 | dBm | (EISREFSENS\_50M + 28.7.)+ 10log10(NRB x SCS x 12 / factor) | | | |
| BWInterferer | MHz | 50 | 100 | 200 | 400 |
| FInterferer (offset) | MHz | 50  /  -50  NOTE 3 | 100  /  -100  NOTE 3 | 200  /  -200  NOTE 3 | 400  /  -400  NOTE 3 |
| NOTE 1: The interferer consists of the Reference measurement channel specified in Annex A.3.2 with one sided dynamic OCNG Pattern as described in Annex A.3.2 and set-up according to Annex C.  NOTE 2: EISREFSENS\_50M declared by the vendor is an integer value in the range specified in Table 10.3.2-2 for different types of NTN VSAT.  NOTE 3: The absolute value of the interferer offset FInterferer (offset) shall be further adjusted to (CEIL(|FInterferer(offset)|/SCS) + 0.5)\*SCS MHz with SCS the sub-carrier spacing of the wanted signal in MHz. Wanted and interferer signal have same SCS.  [NOTE 4: The transmitter shall be set to same as the PUMAX,f,c as defined in clause 6.2.4, with uplink configuration specified in Clause 10.3.]  NOTE 5: The “factor” represents the normalized factor to scale wanted signal and interference level for different (Channel bandwidth, SCS) configurations. The value of factor is 66 RBs x 60 kHz SCS x 12, i.e. 47520 kHz. | | | | | |

The wanted signal and interference signal is supposed to come from the same directions

**Issue 2-4: Beam steering range and test direction to fulfill minimum EIS requirement**

**Agreement:**

* NTN VSAT need to declare its supported lowest elevation angle from receiver perspective regardless of mechanical steering antenna or electronic steering antenna or hybrid
* For measurement metric for min EIS , the EIS should be verified between the declared supported receiver lowest elevation angles (as shown in Figure 1-3).
* **Figure 1-3** example measurement grid for min EIS of the supported elevation angle
* 
  + Offline agreement:
  + The minimum elevation angle for both transmitter and receiver is up to the declaration by vendor..

**Issue 2-5: Receiver antenna off-axis performance**

* Proposal 1: to consider receiver antenna off-axis performance as in [R4-2408702](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408702.zip)

**Agreement:**

* Proposal 1 is agreeable.

**NR\_NTN\_enh\_SAN\_UE\_demod**

**Issue 1-1-1: Power class and NTN UE Types**

* Agreement
  + Not include UE power class and UE Type 1~5 for the FR2-NTN demod requirements explicitly, the demod requirements are applicable to all UE types by default.

**Issue 1-1-2: Clarification on TS 38.101-5 structure for radiated requirements**

* Agreement
  + Follow the specification structure of section 8.1 for FR1-NTN in TS 38.101-5 for FR2-NTN performance requirements

**Issue 1-2-1: K\_offset for GSO and NGSO for above 10 GHz bands**

* Agreement
  + K\_offset for 120kHz SCS
    - 8 for NGSO
    - 258 for GSO

**Issue 1-2-2: PTRS configuration**

* Agreement
  + No need further ideal simulation results alignment among companies with and without PT-RS configuration in the simulation
  + Not configure PTRS for all NTN PDSCH demodulation requirements with MCS 4 and MCS 13 for above 10 GHz

**Issue 1-3-1: CORESET RB**

* Agreement
  + Change the CORESET RB from 60 to 132 with consideration 200MHz channel bandwidth

**Issue 1-3-2: Payload size for DCI format 1\_0 case**

* Agreement
  + Change the payload size from 40 to 42 with consideration of 200MHz channel bandwidth

**Issue 2-1-1: The number of demodulation branches**

* Agreement
  + Keep the previous agreement, i.e. both 1Rx and 2Rx, with the test applicability rule for support of different number of demodulation branches based on declaration.

**Issue 2-2-1: MCS**

* Agreement
  + MCS 2 and MCS 12

**Issue 2-2-2: PTRS configuration**

* Agreement
  + Not configure PTRS for test with MCS 2 and MCS12

**Issue 2-4-1: PUCCH format 0**

* Agreement
  + Keep case with first symbol is 12 with 2 symbols.

**Issue 2-4-2: PUCCH format 3**

* Agreement
  + Keep case#1 with first symbol is 0 with 14 symbols.

**Issue 2-5-1: Test metric**

* Agreement
  + The false alarm probability shall be less than or equal to 0.1%.
  + The probability of detection shall be equal to or exceed 99%

**RRM requirements for NR\_NTN\_enh**

**Issue 1-6A: Te\_NTN for 60kHz and 120kHz in Case2**

**Agreement: (online)**

* In Case-2, remove the below side condition for requirement applicability.
  + The requirements are applicable only if the ephemeris information be refreshed (i.e. update rate of ephemeris information in SIB19) at least every [7] seconds.

**Issue 1-11: Additional enhancements (for Case-3)**

**Note**

* Based on the existing gradual timing adjustment UE requirement, i.e. UL timing is supposed to be gradually adjusted (subject to Tp and Tq) upon GNSS location update, the issue is closed. No further discussion.

**Issue 2-4: RRC Re-establishment**

**Agreement: (online)**

* For Type 2 UE, RRC re-establishment requirements do not apply when the cause for the RRC re-establishment is an inter-satellite HO failure.

**Issue 3-2: Measurement period and accuracy requirements on RTD**

**Agreement: (online - Friday)**

* Remove following applicability rule for UE Rx-Tx measurement requirements:
  + When a serving cell change occurs during the measurement period, the UE shall continue and complete the UE Rx-Tx time difference measurement provided that the serving cell change does not impact SRS configuration for the UE Rx-Tx time difference measurement.

**Issue 3-4: Measurement accuracy requirements on UL timing drift**

**Agreement: (online - Friday)**

* No new applicability condition for UE Rx-Tx measurement requirements related to amount of variation in the applied TA during measurement period.

**Issue 3-5: Other impact on RRM**

**Agreement: (online)**

* When UE switches to a new cell with different PCI, UE stops the PRS measurement for the source cell after HO occurs and starts new PRS measurement for the target cell after SRS reconfiguration on the target cell is complete.
  + Further discuss how to capture “starts new measurement” in the CR.
* When UE switches to a new cell with same PCI through hard and soft satellite switch with re-sync, UE stops the PRS measurement at whichever point occurs earlier between t-Service and t-ServiceStart and starts new measurement for the UE Rx-Tx time difference after switch is complete.
  + Further discuss how to capture “starts new measurement” in the CR.

**Issue 4-1: TN to NTN cell reselection**

**Agreement: (online)**

* It is a common understanding that location-based measurement triggering parts are not applicable for cell reselection from TN to NTN. Whether/How to implement this in RAN4 spec is left to CR.
* If both TN and NTN carriers are broadcasted for neighbour cells measurement in IDLE/Inactive mode,
  + For NTN capable UE, the cell reselection requirements (i.e., the TN to NTN reselection requirement agreed in RAN4 #110) are applied to both TN and NTN target cells/carriers.
  + FFS: For NTN incapable UE, the existing TN-to-TN cell reselection requirements are applied.
    - Further check does UE know whether it is a TN carrier or NTN carrier

**Issue 4-2: NTN to TN cell reselection**

**Agreement: (online)**

* Clarify the requirements related to TN measurement skipping as follows:
  + UE shall perform TN measurement if its estimated distance to tn-ReferenceLocation is smaller than tn-DistanceRadius. The requirements apply provided that the actual distance between UE to tn-ReferenceLocation is smaller than tn-DistanceRadius – 50m.

**Issue 5-1: NTN to NTN RACH-less (C)HO**

**Agreement: (online - Friday)**

* For RACH-less HO/CHO, TIU is the interruption uncertainty in acquiring the first UL transmission resource, which can be a configured grant based PUSCH or dynamic grant based PUSCH according to NW configuration and scheduling.

**Issue 5-2: NTN to NTN Satellite switching without PCI change**

**Agreement: (online)**

* In response to RAN2 LS (R4-2407009\_R2-2403771), RAN4 to confirm that it is feasible to adopt the gNB as the reference point of ssb-TimeOffset for both soft and hard satellite switch scenarios.

**Issue 5-2-S: Soft’ Satellite switch (5-2-S1 and -S2 from RAN4#110 are merged)**

**Agreement: (online)**

* Do not define known case for soft satellite switch.
  + It does not mean RAN4 will define the “known” or “unknown” case in the spec for soft satellite switching.

**Issue 6-2-1: (FR2-NTN) Test set-up and applicability rule**

**Note**

* Based on UE capability and VSAT class defined in Table 9.2.1.0-1 of TS38.101-5, the below proposed applicability rue is evident. Therefore, no separate agreement is pursued.
* Proposal: Mobile UE does not need to pass the TCs with NGSO. Fixed UE needs to pass the TCs with either GSO or NGSO depending on UE capability.

**Issue 6-2-2: (FR2-NTN) Rx beam gain**

**Agreement: (ad-hoc + online)**

* The existing absolute measurement accuracy requirement and relative measurement accuracy requirement of TN FR2 (including intra-frequency and inter-frequency) can be applied for NTN UE above 10GHz with [1]dB relaxation.
  + Note: Companies are encouraged to further evaluate the performance loss due to single polarization assumption on FR2 Ka band VSAT UE. It’s not precluded to further update the tentative relaxation value in future RAN4 meeting.
* Remove an RF margin for different RX beams in the relative accuracy.
* Define the minimum SSB\_RP condition for accuracy requirement of five UE types specified in table 9.2.1.0-1 of TS38.101-5. Minimum SSB\_RP\_NTN\_FR2 for Rx Beam Peak angle of arrival = Reference sensitivity UE type, n512, 50MHz +Y -10Log10(PRBRefsens x 12) – SNRRefsens + SSB Ês/Iot + ∆MBP,n, where,
  + Reference sensitivity UE type, n512, 50MHz is the reference sensitivity value in dBm specified for a specific UE type in Band n512 for 50 MHz Channel bandwidth in Table 10.3.2-1 and section 10.3.3-1 of TS 38.101-5.
  + PRBRefsens is NRB associated with subcarrier spacing 120 kHz for 50MHz in TS 38.101-5 Table 5.3.2-2, and is 32;
  + SNRRefsens is the SNR used for simulation of Refsens and EIS spherical coverage, and is -1 dB;
  + SSB Ês/Iot is the minimum value required by the UE to perform measurements, and is -6 dB for intra-frequency measurements and -4 dB for inter-frequency measurements. The only contribution to Iot is the UE internal noise;
  + ∆MBP,n is 0.
* For the minimum SSB\_RP condition,
  + The gain difference between fine and rough beams is YdB:
    - For mechanical steering antenna, Y=0
    - For electronic steering antenna, FFS Y
* Do not define separate spherical coverage unless spherical coverage is introduced in RF session.
* FFS: Gmin and Gmax
* Note: If anything above inconsistent with RF requirement is identified, RAN4 to make updates to those aspects accordingly.

**Issue 6-2-3: (FR2-NTN) UL timing accuracy**

**Agreement: (ad-hoc)**

* The value for for mobile and fixed UEs shall be introduced for uplink timing error requirements for FR2 NTN (Ka band introduced in Rel-18 )
  + Further discuss the exact values:
    - Option 1: X = []
    - Other options not precluded
* In the test case of UE transmission timing accuracy for Case-3 (120kHz SCS) (Mobile UE for GSO):
  + UE mobility is not considered before the testability issue is resolved. And without consideration of UE mobility during test, UE test requirement for Case-3 will be further discussed considering necessary margin.
  + It’s not precluded to further update test case including test requirements for case -3 if testability issue on UE mobility resolved in future release.

**Agreement: (ad-hoc)**

* Only define test case with UL SCS 120kHz and DL SSB SCS 120kHz

**Issue 6-2-4: (FR2-NTN) Mobility**

**Note**

* The below proposal is expected to be reflected in relevant test cases as per the agreed core requirements without further agreements.
* Proposal: For mobility test cases involving UEs with mechanically steered beams,
  + make a note that the timing requirement for the completion of the mobility procedure depends on the setup of the test case, considering UE “minimum steering speed” of 22 degrees/s.

**Issue 6-2-7: (FR2-NTN) Measurement accuracy**

* Note: Covered in Issue 6-2-2: (FR2-NTN) Rx beam gain

**Issue 6-2-8: (FR2-NTN) Test case details**

**Note**

* The RMC configurations:
  + Option 1: Use the TN table as baseline, and only specify the different ones (delta approach).
  + Option 2: Copy the TN table, and update value which is different with TN configuration.

**Issue 6-2-9: (FR2-NTN) AoA setup**

**Agreement: (online)**

* Use the following AoA setup for test cases:
  + Transmission timing accuracy: single AoA in Rx beam direction, if defined and applicable.
  + Inter-satellite mobility: 2-AoA setup
    - Offset of relative angles of 2 AoAs from UE perspective is 30 degrees in Rel-18 test.
    - The AoA is set up with the corresponding UE RF requirements fulfiled.
    - The AoA and the epherimis information of two satellites are aligned.
  + The rest test cases: single AoA in Rx beam direction, if defined and applicable

**Issue 6-3-2: (FR1-NTN) Idle mode mobility, NTN-TN inter-frequency cell reselection**

**Agreement: (ad-hoc)**

* In NTN-TN cell reselection test case,
  + Set the distance between the UE and tn-ReferenceLocation as tn-DistanceRadius - 50m.
  + Only one TN neighbour cell is configured.
  + Note: Detailed test configurations and procedures are confirmed by the review and endorsement of relevant test case CR.
  + Note: TN measurement skipping is not verified.

**Issue 6-3-3: (FR1-NTN) Connected mode mobility, Satellite switch**

**Agreement: (ad-hoc)**

* In the TCs for satellite switch,
  + GSO test configuration is not applicable.
  + (t-Service - t-serviceStart) > (Tsearch + T∆ + Tmargin)
* Note: Reflect above agreements into draft CRs

**Issue 6-3-5: (FR1-NTN) Connected mode mobility, NTN to NTN RACH-less HO**

**Agreement: (ad-hoc)**

* NTN to NTN RACH-less HO test case is defined, and the detailed test configurations and procedures are confirmed by the review and endorsement of relevant test case CR.

**Issue 6-3-6: (FR1-NTN) Measurement procedure and accuracy, Network verified UE location**

**Agreement: (ad-hoc)**

* Do not define test case for network verified UE location.

#### 2.4.2 Remaining Open issues

No remaining open issues.

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

## 4.1 RAN1

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## 4.2 RAN2

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## 4.3 RAN3

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## 4.4 RAN4

**RAN4#110bis meeting, Changsha, China, April 15 - 19, 2024:**

* R4-2405315 discussion Discussions on Fixed and Mobile VSAT def and abbr Samsung
* R4-2405320 draftCR draft CR for TS 38.101-5 Chapter 3 Samsung
* R4-2405340 other Doppler shift issues for guard band and transmission bandwidth configuration Huawei, HiSilicon
* R4-2405976 CR CR for TR 38.863 regulatory update after WRC-23 THALES
* R4-2405994 draftCR CR for TR 38.863 regulatory update after WRC-23 THALES
* R4-2405923 draftCR Draft CR to TS 38.108: Correction of the NTN frequency ranges, Rel-18 Huawei, HiSilicon
* R4-2405705 draftCR draft CR to 38.108: Correction of applicability table for SAN NEC
* R4-2405993 draftCR draft CR for TS 38.101-5 Chapter 3 Samsung, Cybercore
* R4-2405393 other Views on coexistence study between TN and NTN above 10GHz bands Qualcomm Incorporated
* R4-2405972 discussion On the ACS requirement issue for VSAT UE in above 10 GHz THALES, Magister Solutions Ltd, Eutelsat Group, ESA, Inmarsat, Viasat, Novamint, EchoStar, Amazon
* R4-2405337 other Discussion on Ka band NTN UE ACS Huawei, HiSilicon
* R4-2405084 draftCR draf CR on TR38.863 Addition of coeixstence results in above 10GHz Samsung Electronics
* R4-2405086 discussion Discussion on NTN VSAT UE ACS Samsung Electronics
* R4-2404938 other NTN enhancement - coexistence: further discussion on NTN UE ACS Ericsson
* R4-2404439 other Further discussion on NTN UE ACS for above 10GHz bands CATT
* R4-2405977 CR CR for correction of SAN ACS value in TS 38.108 THALES
* R4-2405924 draftCR Draft CR to TS 38.108: Correction of the OOBB requirement, Rel-18 Huawei, HiSilicon
* R4-2405925 draftCR Draft CR to TS 38.108: missing references, Rel-18 Huawei, HiSilicon
* R4-2406113 draftCR CR for correction of SAN ACS value in TS 38.108 THALES
* R4-2405996 draftCR Draft CR to TS 38.108: missing references, Rel-18 Huawei, HiSilicon
* R4-2405999 draftCR Draft CR for TS 38.181: FR2 intro in clause 4.1 MUs Ericsson, Thales
* R4-2406000 draftCR Draft CR for TS 38.181: FR2 intro in clause 4.7 test config Ericsson, Thales
* R4-2406001 draftCR Draft CR for TS 38.181: FR2 intro in clause 9.4 output power dynamics Ericsson, Thales
* R4-2405928 discussion Discussion on the Extreme testing conditions for NTN SAN (Ka band) Huawei, HiSilicon
* R4-2405929 discussion Discussion on the MU values for Ka band Huawei, HiSilicon
* R4-2405888 draftCR NTN enhancement - Running draft CR to TS 38.181 Ericsson
* R4-2405997 draftCR Draft CR for TS 38.181, On RF channels and test models in clause 4.9 for Ka-band NTN CATT
* R4-2405998 draftCR Draft CR for TS 38.181, On radiated receiver characteristic in clauses10.1 and 10.2 for Ka-band NTN CATT
* R4-2406076 draftCR Draft CR for TS 38.181, On radiated receiver characteristic in clauses10.3 for Ka-band NTN CATT
* R4-2405555 draftCR Draft CR for TS 38.181: FR2 intro in clause 4.1 MUs Ericsson, Thales
* R4-2405556 draftCR Draft CR for TS 38.181: FR2 intro in clause 4.7 test config Ericsson, Thales
* R4-2405557 draftCR Draft CR for TS 38.181: FR2 intro in clause 9.4 output power dynamics Ericsson, Thales
* R4-2405558 draftCR Draft CR for TS 38.181: FR2 intro in clause 9.7.5 spurious emissions Ericsson, Thales
* R4-2404440 draftCR Draft CR for TS 38.181, On applicability of requirements in clause 4.8 for Ka-band NTN CATT
* R4-2404441 draftCR Draft CR for TS 38.181, On RF channels and test models in clause 4.9 for Ka-band NTN CATT
* R4-2404442 draftCR Draft CR for TS 38.181, On radiated receiver characteristic in clauses10.1 and 10.2 for Ka-band NTN CATT
* R4-2404443 draftCR Draft CR for TS 38.181, On radiated receiver characteristic in clauses10.3 for Ka-band NTN CATT
* R4-2404617 draftCR Draft CR for TS 38.181, On manufacturer declarations in clause 4.6 for Ka-band NTN CATT
* R4-2405085 draftCR draft Big CR to TS 38.101-5 Samsung Electronics
* R4-2405274 other Topic summary for [110bis][121] NR\_NTN\_enh\_UERF\_R18 Moderator(ZTE)
* R4-2405341 draftCR Draft CR for TR 38.863 to introduce some technical background for R18 NTN VSAT UE Tx requirements Huawei, HiSilicon
* R4-2405318 draftCR draft CR for TS 38.101-5 9.2.1 Samsung
* R4-2405296 discussion Discussion on NTN UE RF Tx requirements Samsung
* R4-2405176 other Discussion on the minimum output power of NTN UE OPPO
* R4-2404939 other NTN enhancement - NTN UE TRP requirement and Tx antenna performance Ericsson
* R4-2404941 draftCR NTN enhancement: draft CR to TS 38.101-5 NTN Ka-band - additional Tx updates to the running CR Ericsson, Thales
* R4-2405640 other Further discussion on Tx RF requirements for NTN in Ka-band ZTE Corporation
* R4-2405641 draftCR Draft CR to TS 38.101-5 Clause 9.3 Output power dynamics ZTE Corporation
* R4-2405339 other Discussion on Tx requirement for Ka band NTN UE Huawei, HiSilicon
* R4-2406602 draftCR NTN enhancement: draft CR to TS 38.101-5 NTN Ka-band - additional Tx updates to the running CR Ericsson, Thales
* R4-2405889 other VSAT type 2 and 5 MPR to meet OFF-axis EIRP Qualcomm Incorporated
* R4-2406605 draftCR Draft CR to TS 38.101-5 Clause 9.3 Output power dynamics ZTE Corporation
* R4-2406604 draftCR Draft CR for TR 38.863 to introduce some technical background for R18 NTN VSAT UE Tx requirements Huawei, HiSilicon
* R4-2406607 draftCR Draft CR for TR 38.863 to introduce some technical background for R18 NTN VSAT UE Rx requirements Huawei, HiSilicon
* R4-2406606 draftCR Draft CR for 38.101-5 to introduce clause 10.1~10.3 Huawei, HiSilicon, Ericsson, Thales
* R4-2406608 draftCR Draft CR to TS 38.101-5 Clause 10.4 Maximum input power requirement ZTE Corporation
* R4-2405974 discussion THALES, Magister Solutions Ltd, Eutelsat Group, ESA, Inmarsat, Viasat, Novamint, EchoStar, Amazon THALES
* R4-2405642 other Further discussion on Rx RF requirements for NTN in Ka-band ZTE Corporation
* R4-2405643 draftCR Draft CR to TS 38.101-5 Clause 10.4 Maximum input power requirement ZTE Corporation
* R4-2405644 draftCR Draft CR to TS 38.101-5 Clause 10.6 Blocking characteristics ZTE Corporation
* R4-2405645 draftCR Draft CR to TS 38.101-5 Annex NTN VSAT related FRC ZTE Corporation
* R4-2404942 draftCR NTN enhancement: draft CR to TS 38.101-5 NTN Ka-band - additional Rx updates to the running CR Ericsson, Thales
* R4-2404940 other NTN enhancement - NTN UE Rx antenna performance Ericsson
* R4-2405314 discussion Discussions on NTN UE RF Rx requirements Samsung
* R4-2405342 other Discussion on Rx requirement for Ka band NTN UE Huawei, HiSilicon
* R4-2405343 draftCR Draft CR for TR 38.863 to introduce some technical background for R18 NTN VSAT UE Rx requirements Huawei, HiSilicon
* R4-2405338 draftCR Draft CR for 38.101-5 to introduce clause 10.1~10.3 Huawei, HiSilicon
* R4-2405197 draftCR Draft CR\_Cell Re-selection for NR UE for Satellite in IDLE state ZTE Corporation
* R4-2405198 draftCR Draft CR\_Cell Re-selection for NR UE for Satellite in Incative state ZTE Corporation
* R4-2406515 draftCR Draft Big CR to TS 38.133 on RRM core requirements for NR NTN enhancement Qualcomm
* R4-2406476 draftCR Draft CR\_Cell Re-selection for NR UE for Satellite in IDLE state ZTE Corporation
* R4-2406477 draftCR Draft CR\_Cell Re-selection for NR UE for Satellite in Incative state ZTE Corporation
* R4-2406478 draftCR Draft CR on VSAT UE timing requirements for NTN in above 10GHz Samsung
* R4-2405594 discussion Discussion on remaining issues for NTN in Ka band Huawei, HiSilicon
* R4-2405595 draftCR draftCR on measurement requirements for NTN in Ka band Huawei, HiSilicon
* R4-2405355 draftCR Draft CR on VSAT UE timing requirements for NTN in above 10GHz Samsung
* R4-2405749 discussion Considerations on Timing Adjustments for FR2-NTN Nokia
* R4-2405191 other Discussion on NR-NTN deployment in above 10GHz bands ZTE Corporation
* R4-2405103 draftCR Draft CR to TS 38.133: Removing brackets around agreed side condition. Ericsson
* R4-2405013 discussion Core requirements for NR-NTN RRM requirements in above 10 GHz bands Ericsson
* R4-2404405 draftCR DraftCR on core requirements maintenance for NTN in above 10GHz bands CATT
* R4-2404360 discussion On NR-NTN RRM requirements in above 10 GHz bands Apple
* R4-2405014 discussion Core requirements for Network verified UE location Ericsson
* R4-2405750 discussion Maintenance aspects of network verified UE location Nokia
* R4-2405596 LS out Discussion on RRM requirements for NW verified location Huawei, HiSilicon
* R4-2405597 draftCR draftCR on Rx-Tx measurement requirements Huawei, HiSilicon
* R4-2406482 draftCR draftCR on Rx-Tx measurement requirements Huawei, HiSilicon
* R4-2406483 draftCR draftCR on requirements for satellite switch with re-sync Huawei, HiSilicon
* R4-2406481 draftCR draft CR on RRC\_CONNECTED state mobility for NTN vivo
* R4-2405598 discussion Discussion on mobility enhancements in NTN Huawei, HiSilicon
* R4-2405599 draftCR draftCR on requirements for satellite switch with re-sync Huawei, HiSilicon
* R4-2405751 discussion Discussion on Satellite switching with resynchronization Nokia
* R4-2406479 draftCR Draft CR for 38.133 on handover for NTN Ericsson
* R4-2406480 draftCR Draft CR for 38.133 on satellite switch Ericsson
* R4-2406485 draftCR (NR\_NTN\_enh-Core) draft CR on core maintenance for R18 NTN mobility and service continuity Apple
* R4-2405015 discussion Core requirements for NTN-TN and NTN-NTN mobility and service continuity enhancements Ericsson
* R4-2405019 draftCR Draft CR for 38.133 on handover for NTN Ericsson
* R4-2405020 draftCR Draft CR for 38.133 on satellite switch Ericsson
* R4-2405110 discussion Discussion on maintenance issues for NTN mobility enhancements vivo
* R4-2405192 other Discussion on NTN-TN and TN-NTN mobility ZTE Corporation
* R4-2405114 draftCR draft CR on RRC\_CONNECTED state mobility for NTN vivo
* R4-2404361 discussion On mobility and service continuity for eNTN Apple
* R4-2404362 draftCR (NR\_NTN\_enh-Core) draft CR on core maintenance for R18 NTN mobility and service continuity Apple
* R4-2404683 discussion (NR\_NTN\_enh-Core) Discussion on the maintenance issue for NR NTN enhancement CMCC
* R4-2404564 discussion Discussion on NTN-TN and NTN-NTN mobility and service continuity enhancements Xiaomi
* R4-2404562 discussion Discussion on NR-NTN RRM performance requirements in above 10 GHz bands Xiaomi
* R4-2404637 discussion Discussion on NTN performance requirements in Ka band Samsung
* R4-2404363 discussion On NR-NTN accuracy requirements in above 10 GHz bands Apple
* R4-2404406 discussion Discussion on performance requirements for NTN in above 10GHz bands CATT
* R4-2405111 discussion Discussion on test cases desgin for NTN bands above 10GHz vivo
* R4-2405016 discussion RRM performance requirements for above 10GHz Ericsson
* R4-2405752 discussion On the configuration of test cases in FR2-NTN Nokia
* R4-2405600 discussion Discussion on performance requirements for Rel-18 NTN Huawei, HiSilicon
* R4-2405435 discussion Discussion on NR-NTN RRM performance requirements in above 10 GHz bands MediaTek inc.
* R4-2405017 discussion RRM performance requirements for Network verified UE location Network verified UE location Ericsson
* R4-2405112 discussion Discussion on performance requirements for NW verified UE location vivo
* R4-2405113 discussion Discussion on test cases desgin for NTN mobility enhancements vivo
* R4-2405018 discussion RRM performance requirements on NTN-TN and NTN-NTN mobility and service continuity enhancements Ericsson
* R4-2404407 discussion Discussion on performance requirements for NTN-TN and NTN-NTN mobility and service continuity enhancements CATT
* R4-2404638 discussion Discussion on RRM performance part for NTN mobility enhancements Samsung
* R4-2404684 discussion (NR\_NTN\_enh-Perf) Discussion on the test cases for NR NTN bands below 10GHz CMCC
* R4-2404563 discussion Discussion on NR-NTN RRM performance requirements in below 10 GHz bands Xiaomi
* R4-2405753 discussion Performance Aspects of Satellite Switch with resync Nokia
* R4-2405542 discussion Discussion on NR NTN SAN demodulation requirement Ericsson
* R4-2405543 other Simulation results on NR NTN SAN demodulation requirement Ericsson
* R4-2405869 discussion Discussion and simulation results for NTN enhancement Samsung
* R4-2404444 other Further discussion on SAN demodulation requirements for above 10 GHz bands CATT
* R4-2404445 other Simulation results for SAN demodulation requirements for above 10 GHz bands CATT
* R4-2404136 discussion Discussion on NR NTN SAN Demodulation Nokia
* R4-2405142 discussion Discussion on SAN demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2405143 other Simulation results on SAN demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2405144 discussion Discussion on UE demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2405145 other Simulation results on UE demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2404137 discussion Discussion on NR NTN UE Demodulation Nokia
* R4-2404297 discussion On UE demod requirements for NR NTN enhancement Apple
* R4-2404298 discussion Simulation results for FR2 NTN Apple
* R4-2405931 discussion [NR\_NTN\_enh-Perf] Discussion on the performance requirements for NR NTN enhancements Qualcomm India Pvt Ltd
* R4-2405932 discussion [NR\_NTN\_enh-Perf] Simulation resutls for NR NTN enhancements Qualcomm India Pvt Ltd
* R4-2405481 discussion On general and UE demodulation requirement for NTN enhancement Ericsson
* R4-2405482 other Simulation results for NR NTN enhancement UE demodulation Ericsson
* R4-2405844 other Topic summary for [110bis][325] NR\_NTN\_enh\_SAN\_UE\_demod Moderator (Huawei)
* R4-2405825 other Topic summary for [110bis][305] NR\_NTN\_enh\_Part1 Moderator (Thales)
* R4-2405826 other Topic summary for [110bis][306] NR\_NTN\_enh\_Part2 Moderator (Ericsson)
* R4-2405827 other Topic summary for [110bis][307] NR\_NTN\_enh\_Part3 Moderator (Samsung)
* R4-2406292 other Ad-hoc minutes on RRM requirements for NR\_NTN\_enh Samsung
* R4-2405995 other Way Forward for [110bis][305] NR\_NTN\_enh\_Part1 Doppler precompensation into the guard band Huawei, Thales
* R4-2406002 other Way Forward for [110bis][306] NR\_NTN\_enh\_Part2 Extreme conditions and MU Huawei
* R4-2406021 other Ad-hoc meeting minutes for [110bis][325] NR\_NTN\_enh\_SAN\_UE\_demod Huawei
* R4-2406129 other Ad-hoc meeting minutes for [110bis][307] NR\_NTN\_enh\_Part3 Samsung
* R4-2406130 other Way Forward for [110bis][307] NR\_NTN\_enh\_Part3 Samsung
* R4-2406024 other Way Forward for [110bis][325] NR\_NTN\_enh\_SAN\_UE\_demod Huawei
* R4-2406429 LS out LS on UE capability for NW verified location Qualcomm
* R4-2406430 other WF on RRM requirements for NR\_NTN\_enh Qualcomm
* R4-2406609 other WF on Rel-18 NTN UE RF requirements ZTE, Samsung
* R4-2405146 other Simulation assumption on demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2405147 other Simulation results summary on demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2404832 other Topic summary for [110bis][221] NR\_NTN\_enh Moderator (Qualcomm)
* R4-2406134 other Way Forward for [110bis][307] NR\_NTN\_enh\_Part3 Samsung
* R4-2406496 LS out LS on UE capability for NW verified location Qualcomm

**RAN4#111 meeting, Fukuoka city, Japan, May 20 - 24, 2024:**

* R4-2407323 other VSAT performance requirements and testability Eutelsat Group
* R4-2408194 CR CR to 38.108: Correction of applicability table for SAN NEC
* R4-2409324 draftCR Draft CR for 38.101-5 to fix the channel raster wordings for FR2-NTN Huawei, HiSilicon
* R4-2409323 other Discussion on conclusion of Ka band coexistence study Huawei, HiSilicon
* R4-2408414 CR CR on TR 38.863 Addition of simulation results in above 10GHz Samsung
* R4-2408415 CR CR on TR38.863 Summary of coeixstence results in above 10GHz Samsung
* R4-2407509 other Discussion on note of the NTN UE ACS table CATT
* R4-2407471 other Discussion on ACS interferer frequency offset for SAN type 2-O CATT
* R4-2407472 CR (NR\_NTN\_enh-Core)CR for TS 38.108, Correction on ACS interferer frequency offset for SAN type 2-O CATT
* R4-2408697 CR NTN enhancement - Running CR to TS 38.108 Ericsson, Thales, CATT, Huawei, ZTE, NEC
* R4-2409553 CR Updated running CR to TS 38.108 NTN Ka-band Huawei, HiSilicon
* R4-2409541 CR CR to TS 38.108: Band-agnostic OBUE requirement Huawei, HiSilicon
* R4-2409542 CR CR to TS 38.181: Band-agnostic OBUE requirement Huawei, HiSilicon
* R4-2409556 discussion Further discussion on test conditions for NTN SAN (Ka band) Huawei, HiSilicon
* R4-2409561 draftCR Updated running draft CR to TS 38.181: missing SAN type 2-O corrections Huawei, HiSilicon
* R4-2409444 draftCR DraftCR to 38.181: Additional correction on FR2-NTN introduction MU table Keysight Technologies UK Ltd
* R4-2409117 draftCR Draft CR for TS 38.181: FR2 intro in clause 9.7.5 spurious emissions Ericsson, Thales
* R4-2408696 CR NTN enhancement - Running CR to TS 38.181 Ericsson, CATT, Thales
* R4-2407473 draftCR Draft CR for TS 38.181, On manufacturer declarations in clause 4.6 for Ka-band NTN CATT
* R4-2407474 other Discussion on SAN extreme testing conditions for NTN SAN (Ka band) CATT
* R4-2407475 CR (NR\_NTN\_enh-Perf)CR for TS 38.181, Add Declaration identifier for SAN extreme testing condition declaration CATT
* R4-2408195 discussion Discussion on extreme conditions for SAN NEC
* R4-2408196 CR CR to 38.181: Removal of extreme conditions from SAN conformance specifications NEC
* R4-2409674 draftCR DraftCR for TS 38.181: FR2-NTN introduction in Clause 9.6 OTA transmitted signal quality THALES
* R4-2409619 draftCR DraftCR for TS 38.181: Clause 10.5 OTA in-band selectivity and blocking ZTE Corporation, Sanechips
* R4-2409620 draftCR DraftCR for TS 38.181: Clause 10.6 OTA out-of-band blocking ZTE Corporation, Sanechips
* R4-2409621 draftCR DraftCR for TS 38.181: Clause 10.9 OTA in-channel selectivity ZTE Corporation, Sanechips
* R4-2409821 draftCR DraftCR to 38.181: Additional correction on FR2-NTN introduction MU table Keysight Technologies UK Ltd
* R4-2409668 draftCR DraftCR for TS 38.181: FR2-NTN introduction in Clause 9.2 Radiated transmit power THALES, Ericsson
* R4-2409670 draftCR DraftCR for TS 38.181: FR2-NTN introduction in Clause 9.3 OTA SAN output power THALES, Ericsson
* R4-2409737 draftCR DraftCR for TS 38.181: FR2-NTN introduction in Clauses 9.7.1 General 9.7.2 OTA occupied bandwidth 9.7.3 ACLR THALES
* R4-2409735 draftCR DraftCR for TS 38.181: FR2-NTN introduction in Clause 9.7.4 OTA out-of-band emissions THALES
* R4-2408416 CR Big CR to TS38.101-5 Samsung R&D Institute UK
* R4-2408698 other NTN enhancement - NTN UE Tx requirements Ericsson
* R4-2408700 draftCR NTN enhancement: draft CR to TS 38.101-5 NTN Ka-band - additional Tx updates to the running CR - subclause 9.6 Ericsson, Thales
* R4-2408701 draftCR NTN enhancement: draft CR to TS 38.101-5 NTN Ka-band - additional Tx updates to the running CR Ericsson
* R4-2409044 other On NTN UE RF Tx requirements Samsung
* R4-2409047 draftCR draft CR for TS 38.101-5 Chapter 9.2.1 Samsung
* R4-2409325 draftCR Draft CR for 38.101-5 to clarify the polarization charactertistic for general Tx requirements Huawei, HiSilicon
* R4-2409329 other Discussion on Tx requirement for Ka band NTN UE Huawei, HiSilicon
* R4-2409331 CR CR for TR 38.863 to introduce some technical background for R18 NTN VSAT UE Tx requirements Huawei, HiSilicon
* R4-2407462 draftCR Draft CR for R4-2405085 to add OFF-axis AMPR Qualcomm Incorporated
* R4-2409758 draftCR Tx Corrections to TS 38.101-5 THALES, Ericsson
* R4-2409777 draftCR Corrections to EIRPmax in TS 38.101-5 THALES
* R4-2409616 other Further discussion on Tx RF requirements for NTN in Ka-band ZTE Corporation, Sanechips
* R4-2409617 other Further discussion on Rx RF requirements for NTN in Ka-band ZTE Corporation, Sanechips
* R4-2409618 draftCR Draft CR to TS 38.101-5 Clause 10.4, 10.6, 10.8 and Annex ZTE Corporation, Sanechips
* R4-2409332 CR CR for TR 38.863 to introduce some technical background for R18 NTN VSAT UE Rx requirements Huawei, HiSilicon
* R4-2409330 other Discussion on Rx requirement for Ka band NTN UE Huawei, HiSilicon
* R4-2409326 draftCR Draft CR for 38.101-5 to introduce clause 10.1~10.3 Huawei, HiSilicon
* R4-2409048 draftCR draft CR for TS 38.101-5 Chapter 10.3 Samsung
* R4-2409045 other On NTN UE RF Rx requirements Samsung
* R4-2408702 draftCR NTN enhancement: draft CR to TS 38.101-5 NTN Ka-band - additional Rx updates to the running CR Ericsson
* R4-2408699 other NTN enhancement - NTN UE Rx requirements Ericsson
* R4-2409327 draftCR Draft CR for 38.101-5 to introduce NS for regional regulatory requirements Huawei, HiSilicon
* R4-2409328 other Discussion on how to organize the regulation requirements for Ka band Huawei, HiSilicon
* R4-2407460 draftCR (NR\_NTN\_enh-Core) Baseline-Big CR for RAN4#111 draft CRs to TS 38.133 on RRM requirements for NR NTN enhancement\_v0 Qualcomm Incorporated
* R4-2407305 discussion On RRM requirements in bands above 10GHz Apple
* R4-2407841 draftCR draftCR on L3-RSRP measurement requirements maintenance in above 10 GHz scenario Xiaomi
* R4-2407677 draftCR Draft CR on VSAT UE timing requirements for NTN in above 10GHz Samsung
* R4-2409284 discussion Discussion on remaining issues for NTN in Ka band Huawei, HiSilicon
* R4-2409285 draftCR draftCR on measurement requirements for NTN in Ka band Huawei, HiSilicon
* R4-2409056 other On side condition for timing requirements Ericsson
* R4-2409058 draftCR Draft CR to TS 38.133: Removing side condition. Ericsson
* R4-2409059 LS out LS reply on reference point for SSB-TimeOffset Ericsson
* R4-2408868 discussion Discussion on maintenance issues for NTN bands above 10GHz vivo
* R4-2408419 discussion Discussion on RRM core maintenance for NTN in above 10GHz Samsung
* R4-2408510 discussion Discussion on Side Conditions for UE transmit timing requirements Nokia
* R4-2408511 discussion Discussion on UE RX-TX Time difference Nokia
* R4-2408605 discussion Core requirements for Network verified UE location Ericsson
* R4-2408869 discussion Discussion on maintenance issues for NW verified UE location vivo
* R4-2409286 discussion Discussion on RRM requirements for NW verified location Huawei, HiSilicon
* R4-2409287 draftCR draftCR on Rx-Tx measurement requirements Huawei, HiSilicon
* R4-2409288 LS out Discussion on mobility enhancements in NTN Huawei, HiSilicon
* R4-2409289 draftCR draftCR on requirements for satellite switch with re-sync Huawei, HiSilicon
* R4-2408867 discussion Discussion on maintenance issues for NTN mobility enhancements vivo
* R4-2408606 discussion Core requirements for NTN-TN and NTN-NTN mobility and service continuity enhancements Ericsson
* R4-2408512 CR CR to TS 38.133 on applicability of soft satellite switching requirements Nokia
* R4-2408513 CR CR to TS 38.133 on RLM and measurements during satellite switching with resynchronization Nokia
* R4-2408514 discussion Considerations on Soft Satellite Switch Capability Nokia
* R4-2407840 discussion Discussion on NTN-TN and NTN-NTN mobility and service continuity enhancements Xiaomi
* R4-2407932 discussion (NR\_NTN\_enh-Core) Discussion on the maintenance issue and the LS from RAN2 for NR NTN enhancement CMCC
* R4-2407306 discussion On mobility and service continuity for eNTN Apple
* R4-2407307 LS out Reply LS on reference point for SSB-TimeOffset Apple
* R4-2408608 draftCR Draft CR for 38.133 on Radio Link Monitoring test for NTN Ericsson
* R4-2408870 discussion Discussion on test cases design for NTN bands above 10GHz vivo
* R4-2408864 draftCR Draft CR on test case for NTN RLM requirements in bands above 10GHz vivo
* R4-2408515 discussion Dicussion on Testability of Case 3 UEs in FR2-NTN Nokia
* R4-2408420 discussion Discussion on NTN performance requirements in Ka band Samsung
* R4-2409290 discussion Discussion on performance requirements for NTN in Ka band Huawei, HiSilicon
* R4-2409291 draftCR draftCR on TC for inter-satellite HO for FR2-NTN Huawei, HiSilicon
* R4-2407308 discussion On NR-NTN accuracy requirements in above 10 GHz bands Apple
* R4-2407461 draftCR (NR\_NTN\_enh-Perf) draft CR on TC for Connected mode mobility in FR2-NTN Qualcomm Incorporated
* R4-2407364 draftCR (NR\_NTN\_enh-Perf) Test case of SSB based L1-RSRP measurement for NTN above 10GHz Apple
* R4-2407842 draftCR draftCR on test case for L3-RSRP measurement without gap under non-DRX with SSB index reading in above 10 GHz scenario Xiaomi
* R4-2407678 draftCR Draft CR on test cases of VSAT UE timing requirements for NTN in above 10GHz Samsung
* R4-2409292 draftCR draftCR on UE Rx-Tx time difference accuracy requirements Huawei, HiSilicon
* R4-2409293 discussion Discussion on RRM tests for mobility enhancement in NTN Huawei, HiSilicon
* R4-2408421 discussion Discussion on RRM performance part for NTN mobility enhancements Samsung
* R4-2408607 discussion RRM performance requirements for NTN enhancements Ericsson
* R4-2407933 draftCR (NR\_NTN\_enh-Perf) draftCR to TS 38.133 Introduction of satellite switch test cases for NTN enh CMCC
* R4-2407964 draftCR Draft CR on TC for NTN-NTN time-based trigger CHO enhancements for NR NTN LG Electronics Inc.
* R4-2407195 discussion Discussion on the performance requirement for NR NTN enhancement below 10GHz MediaTek inc.
* R4-2407196 draftCR Introduce the test for NTN to NTN RACH-less HO MediaTek inc.
* R4-2409691 draftCR Draft CR \_Cell Reselection for NR UE for Satellite in IDLE state ZTECorporation,Sanechips
* R4-2409692 draftCR Draft CR \_Cell Reselection for NR UE for Satellite in INACTIVE state ZTECorporation,Sanechips
* R4-2409695 draftCR Draft CR for test case on NTN to LTE TN ZTECorporation,Sanechips
* R4-2409696 draftCR Draft CR for test case on NTN to NR TN ZTECorporation,Sanechips
* R4-2409867 other Simulation assumption on demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2408977 other Simulation assumption on demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2408978 other Simulation results summary on demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2408981 draftCR Draft CR on NTN radiated performance requirements for PUSCH (TS38.108, Rel-18) Huawei,HiSilicon
* R4-2408982 draftCR Draft CR on MU, manufacturer declarations and applicability rules for NTN (TS38.181, Rel-18) Huawei,HiSilicon
* R4-2408983 draftCR Draft CR on NTN OTA performance requirements for PUCCH (TS38.181, Rel-18) Huawei,HiSilicon
* R4-2408973 discussion Discussion on SAN demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2408974 other Simulation results on SAN demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2409482 discussion Discussion and simulation results for NTN enhancement Samsung
* R4-2409483 draftCR Draft CR on performance requirements for PUSCH with DM-RS bundling Samsung
* R4-2409484 draftCR Draft CR on OTA performance requirements for PUSCH Samsung
* R4-2408339 discussion Discussion on NR NTN enhancement SAN demodulation requirements Ericsson
* R4-2408340 other Simulation results for NR NTN enhancement SAN demodulation requirements Ericsson
* R4-2408341 draftCR (NR\_NTN\_enh-Perf) Draft CR for 38.181 on SAN demodulation requirements Ericsson
* R4-2408342 draftCR (NR\_NTN\_enh-Perf) Draft big CR for 38.181 on SAN demodulation requirements Ericsson
* R4-2407142 discussion Discussion on NR NTN SAN Demodulation Nokia
* R4-2407145 draftCR [NR\_NTN\_enh-Perf] draftCR on performance requirements for 38.101-5 Nokia
* R4-2407510 draftCR Draft CR for TS 38.181, Introduction on OTA performance requirement for PRACH CATT
* R4-2407476 other Simulation results for SAN demodulation requirements for above 10 GHz bands CATT
* R4-2407477 draftCR Draft CR for TS 38.108, On Performance requirements for PRACH in clause 11.4 for Ka-band NTN CATT
* R4-2409869 draftCR Draft CR on NTN radiated performance requirements for PUSCH (TS38.108, Rel-18) Huawei,HiSilicon
* R4-2409870 draftCR Draft CR on NTN OTA performance requirements for PUCCH (TS38.181, Rel-18) Huawei,HiSilicon
* R4-2409865 draftCR (NR\_NTN\_enh-Perf) Draft CR for 38.181 on SAN demodulation requirements Ericsson
* R4-2409858 draftCR [NR\_NTN\_enh-Perf] draftCR on performance requirements for 38.101-5 Nokia
* R4-2409909 CR (NR\_NTN\_enh-Perf) Big CR for 38.181 on SAN demodulation requirements Ericsson
* R4-2409864 draftCR Draft CR for TS 38.181, Introduction on OTA performance requirement for PRACH CATT
* R4-2409847 other Simulation results for SAN demodulation requirements for above 10 GHz bands CATT
* R4-2409863 draftCR Draft CR for TS 38.108, On Performance requirements for PRACH in clause 11.4 for Ka-band NTN CATT
* R4-2409871 draftCR Draft CR on performance requirements for PUSCH with DM-RS bundling Samsung
* R4-2409872 draftCR Draft CR on OTA performance requirements for PUSCH Samsung
* R4-2409862 draftCR Draft CR to 38.101-5 on eNTN demod requirements for PDCCH Apple
* R4-2409859 draftCR [NR\_NTN\_enh-Perf] draftCR on PUCCH performance requirements for 38.108 Nokia
* R4-2409860 draftCR [NR\_NTN\_enh-Perf] draftCR on propagation conditions and channels for 38.108 Nokia
* R4-2409861 draftCR [NR\_NTN\_enh-Perf] draftCR on PUSCH demodulation requirements for 38.181 Nokia
* R4-2409868 draftCR Draft CR on NTN PDSCH demodulation requirements (TS38.101-5, Rel-18) Huawei,HiSilicon
* R4-2409866 draftCR [NR\_NTN\_enh-Perf] Draft CR to 38.101-5 Reference measurement channel for PDCCH requirements and channel model for NR NTN enhancements Qualcomm India Pvt Ltd
* R4-2407357 draftCR Draft CR to 38.101-5 for updates to Annex C Apple
* R4-2407146 draftCR [NR\_NTN\_enh-Perf] draftCR on PUCCH performance requirements for 38.108 Nokia
* R4-2407147 draftCR [NR\_NTN\_enh-Perf] draftCR on propagation conditions and channels for 38.108 Nokia
* R4-2407148 draftCR [NR\_NTN\_enh-Perf] draftCR on PUSCH demodulation requirements for 38.181 Nokia
* R4-2407149 CR [NR\_NTN\_enh-Perf] bigCR for 38.108, NR\_NTN Demodulation requirements Nokia
* R4-2407143 other Supporting Simulations for NR NTN UE Demodulation Nokia
* R4-2407144 discussion Discussion on NR NTN UE Demodulation Nokia
* R4-2407251 discussion Simulation results for FR2 NTN Apple
* R4-2407252 draftCR Draft CR to 38.101-5 on eNTN demod requirements for PDCCH Apple
* R4-2408641 draftCR [NR\_NTN\_enh-Perf] Draft CR to 38.101-5 Reference measurement channel for PDCCH requirements and channel model for NR NTN enhancements Qualcomm India Pvt Ltd
* R4-2408678 discussion [NR\_NTN\_enh-Perf] Discussion on the performance requirements for NR NTN enhancements Qualcomm India Pvt Ltd
* R4-2408679 discussion [NR\_NTN\_enh-Perf] Simulation results for NR NTN enhancements Qualcomm India Pvt Ltd
* R4-2408745 draftCR Draft CR to 38.101-5 FRC for PDSCH performance requirement Ericsson
* R4-2408746 discussion On UE demodulation requirement for NTN enhancement Ericsson
* R4-2408747 other Simulation results for NR NTN enhancement UE demodulation Ericsson
* R4-2408975 discussion Discussion on UE demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2408976 other Simulation results on UE demodulation requirements for NR NTN enhancements Huawei,HiSilicon
* R4-2408979 CR Big CR on NTN demodulation requirements (TS38.101-5, Rel-18) Huawei,HiSilicon
* R4-2408980 draftCR Draft CR on NTN PDSCH demodulation requirements (TS38.101-5, Rel-18) Huawei,HiSilicon
* R4-2408931 other Topic summary for [111][120] NR\_NTN\_enh\_UERF\_R18 Moderator(ZTE)
* R4-2408016 other Topic summary for [111][219] NR\_NTN\_enh Moderator (Qualcomm)
* R4-2409853 other Ad-hoc meeting minutes for [111][325] NR\_NTN\_enh\_SAN\_UE\_demod Huawei
* R4-2410118 other Topic summary for [111][325] NR\_NTN\_enh\_SAN\_UE\_demod Moderator (Huawei)
* R4-2410101 other Topic summary for [111][306] NR\_NTN\_enh\_Part2 Moderator (Ericsson)
* R4-2410102 other Topic summary for [111][307] NR\_NTN\_enh\_Part3 Moderator (Samsung)
* R4-2410137 other Ad-hoc minutes for NR\_NTN\_enh WI Samsung
* R4-2409876 other Way Forward for [111][325] NR\_NTN\_enh\_SAN\_UE\_demod Huawei
* R4-2409857 other Ad-hoc meeting minutes for [111][325] NR\_NTN\_enh\_SAN\_UE\_demod Huawei

16.02.2024 minor adaptations for RAN #103

10.11.2023 minor adaptations for RAN #102

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26.04.2023 minor adaptations for RAN #100

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10.01.2022 minor adaptations for RAN #95e

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17.05.2021 minor adaptations for RAN #92e

28.01.2021 minor adaptations for RAN #91e

09.11.2020 minor adaptations for RAN #90e

31.08.2020 minor adaptations for RAN #89e

20.04.2020 minor adaptations for RAN #88e

18.02.2020 minor adaptations for RAN #87e

14.11.2019 minor adaptations for RAN #86

18.08.2019 minor adaptations for RAN #85

12.05.2019 minor adaptations for RAN #84

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v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

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v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

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v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

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v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template