**3GPP TSG-RAN WG4 Meeting #110bis R4-240xxxx**

Changsha, China, 15th – 19th April, 2024

**Agenda item: 6.16.**

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [110bis][306] NR\_NTN\_enh\_Part2

**Document for:** Information

# Introduction

This document is a summary of the proposals made in the contributions submitted under AI 6.16.3 and AI 6.16.4 for the RAN4 #110 meeting.

# Topic #1: SAN RF

No open issue was reported.

### Sub-topic 1-1

*Sub-topic description:* This sub-topic is related to the submitted draft CRs

**Issue 2-3-1: Draft CRs to TS 38.101**

* Proposals: Check if the following draft CRs could be endorsed:

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **To be Endorsed or Revised?** |
| [**R4-2405924**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405924.zip) | Huawei, HiSilicon | Draft CR to TS 38.108: Correction of the OOBB requirement, Rel-18 |  |
| [**R4-2405925**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405925.zip) | Huawei, HiSilicon | Draft CR to TS 38.108: missing references, Rel-18 |  |
| [**R4-2405977**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405977.zip) | THALES | CR for correction of SAN ACS value in TS 38.108  Moderator: The running CR was endorsed in last meeting and not agreed. This CR can’t be agreed, only endorsed. |  |

# Topic #2: SAN RF conformance

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2405928**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405928.zip) | Huawei, HiSilicon | **Proposal 1**: Consider extreme conditions testing for NTN SAN in band agnostic manner, i.e. not to re-open this discussion for each new NTN frequency range or band, e.g. Ka, Ku, etc.  **Proposal 2**: Introduce new dedicated set of optional manufacturer declarations in TS 38.181, table 4.6-1, reflecting existing content of Annex B, with the following modifications (Track Changes):  **Proposal 3**: Improve the existing content of the Annex B in TS 38.181, by applying the unified approach to the manufacturer declarations, with the following modifications (Track Changes): |
| [**R4-2405929**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405929.zip) | Huawei, HiSilicon | **Proposal 1**: Reuse of MU values for 24.25-29.5 GHz range for the purpose of SAN OTA conformance testing in Ka band is possible only under the following conditions (reuse from TS 38.181, clause 4.1):  *The test tolerances for the radiated test requirements (TTOTA) for SAN were reused from TR 37.941 [13]. Reuse of TR 37.941 [13] TTOTA values for SAN LEO radiated conformance testing is subject to the following conditions:*  *- EUT suitability to fit OTA chambers considered in TR 37.941 [13], and*  *- Environmental test conditions assumed for BS testing in TR 37.941 [13].*  *Reuse of TR 37.941 [13] TTOTA values for SAN GEO radiated conformance testing may not be justified for some products due to too large SAN GEO antenna array dimensions, and required OTA RF chamber size.*  **Proposal 2**: Disclaimer text in Proposal 1 can be subject to further adjustments subject to different SAN antenna arrays for Ka band (as compared to NTN-FR1), and is FFS. |

## Open issues summary

### Sub-topic 2-1

*Sub-topic description:* This sub-topic is related to testing under extreme conditions.

**Issue 2-1-1: Extreme conditions**

* Proposals: To better address the extreme conditions aspects:
  + Extreme condition should be considered in a band agnostic manner, similarly for all NTN bands (Huawei, proposal 1 R4-2405928)
  + A set of optional manufacturer declarations (see below) should be introduded and Annex B should be updated accordingly (Huawei, proposals 2 and 3 R4-2405928)
* Recommended WF
  + Even if not extensively discussed before, Huawei’s proposals seem relevant, better handling the extreme conditions aspects when testing SAN.

Moderator expects following agreement without discussion:

Extreme conditions shall be addressed in a band agnostic manner and a set of optional manufacturer declarations (see table below) shall be introduced to capture this. Annex B of TS 38.101 shall be updated accordingly.

| Declaration identifier | Declaration | Description | Applicability  (Note 1) | | |
| --- | --- | --- | --- | --- | --- |
| SAN type 1-H  (Note 2) | SAN type 1-O | SAN type 2-O |
| … |  |  |  |  |  |
| D.106 | Minimum barometric pressure | Minimum value of the barometric pressure for the extreme test environment for Satellite Payload RF (SPRF). | o | o | o |
| D.107 | Maximum barometric pressure | Maximum value of the barometric pressure for the extreme test environment for SPRF. | o | o | o |
| D.108 | Minimum relative humidity | Minimum value of the relative humidity for the extreme test environment for SPRF. | o | o | o |
| D.109 | Maximum relative humidity | Maximum value of the relative humidity for the extreme test environment for SPRF. | o | o | o |
| D.110 | Minimum vibration | Minimum value of the vibration for the extreme test environment for SPRF. | o | o | o |
| D.111 | Maximum vibration | Maximum value of the vibration for the extreme test environment for SPRF. | o | o | o |
| D.112 | Additional conditions for extreme testing | Additional (e.g. mission-specific) conditions for the extreme test environment for SPRF. | o | o | o |
| NOTE 1: Manufacturer declarations applicable per SAN *requirement set* were marked as "x" (related radiated declaration applies), "c" (related conducted declaration applies), or “o” (optional declaration). Manufacturer declarations not applicable per SAN *requirement set* were marked as "n/a".  NOTE 2: For *SAN type 1-H*, the only radiated declarations are related to EIRP and EIS requirements. For declarations marked as 'c', related conducted declarations apply, and for declarations marked as 'x', related radiated declarations apply.  NOTE 3: Depending on the capability of the system some of these beams may be the same. For those same beams, testing is not repeated.  NOTE 4: These *operating bands* are related to their respective single‑band RIBs, or single-band TAB connectors.  NOTE 5: As each identified OSDD has a declared minimum EIS value (D.23), multiple operating band can only be declared if they have the same minimum EIS declaration.  NOTE 6: If the *SAN type 1-H* or *SAN type 1-O* is not capable of redirecting the receiver target related to the OSDD then there is only one RoAoA applicable to the OSDD.  NOTE 7: For an OSDD without receiver target redirection range, this is a direction inside the sensitivity RoAoA.  NOTE 8: *OTA coverage range* is used for conformance testing of such TX OTA requirements as occupied bandwidth, frequency error or EVM.  NOTE 9: The *OTA coverage reference* direction may be the same as the Reference beam direction pair (D.8) but does not have to be.  NOTE 10: Parameters for contiguous spectrum operation in the operating band are assumed to be the same unless they are separately declared. When separately declared, they shall still use the same declaration identifier.  NOTE 11: If a SAN is capable of 64QAM DL operation then up to two rated output power declarations may be made. One declaration is applicable when configured for 64QAM transmissions, and the other declaration is applicable when not configured for 64QAM transmissions. | | | | | |

**Issue 2-1-2:**

* Proposals:
  + Inputs from TE vendors are needed (CATT)
  + Reuse MUs specified for FR2 TN BS type 2-O transmitter, keeping values in [] (Ericsson)
* Recommended WF
  + Moderator expects following agreement without discussion:
    - Consider FR2 TN MUs (24.25-29.5 GHz) for SAN type 2-O transmitter tests in 17.3-20.2 GHz.
    - Values are kept in [], encouraging additional inputs from TE vendors.

### Sub-topic 2-2

*Sub-topic description:* This sub-topic is related to measurement uncertainties for NTN-FR2.

**Issue 2-2-1: MU for 24.25-29.5 GHz range**

* Proposals: Reuse of MU values for 24.25-29.5 GHz range for the purpose of SAN OTA conformance testing in Ka band is possible with the below disclaimer. This disclaimer might be further adapted subject to different SAN antenna arrays for the Ka-band.
  + Agree (Huawei)
  + Disagree
* Recommended WF
  + The proposal is similar to the agreement made for NTN-FR1.

Moderator expects following agreement without discussion:

* + - Reuse of MU values for 24.25-29.5 GHz range for the purpose of SAN OTA conformance testing in Ka band is possible with the following disclaimer. This disclaimer might be further adapted subject to different SAN antenna arrays for the Ka-band.

Disclaimer:

*The test tolerances for the radiated test requirements (TTOTA) for SAN were reused from TR 37.941 [13]. Reuse of TR 37.941 [13] TTOTA values for SAN LEO radiated conformance testing is subject to the following conditions:*

*- EUT suitability to fit OTA chambers considered in TR 37.941 [13], and*

*- Environmental test conditions assumed for BS testing in TR 37.941 [13].*

*Reuse of TR 37.941 [13] TTOTA values for SAN GEO radiated conformance testing may not be justified for some products due to too large SAN GEO antenna array dimensions, and required OTA RF chamber size.*

### Sub-topic 2-3

*Sub-topic description:* This sub-topic is related to the submitted draft CRs

**Issue 2-3-1: Draft CRs to TS 38.181**

* Proposals: Check if the following draft CRs could be endorsed:

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **To be Endorsed or Revised?** |
| [**R4-2404440**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404440.zip) | CATT | Draft CR for TS 38.181, On applicability of requirements in clause 4.8 for Ka-band NTN |  |
| [**R4-2404441**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404441.zip) | CATT | Draft CR for TS 38.181, On RF channels and test models in clause 4.9 for Ka-band NTN |  |
| [**R4-2404442**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404442.zip) | CATT | Draft CR for TS 38.181, On radiated receiver characteristic in clauses10.1 and 10.2 for Ka-band NTN |  |
| [**R4-2404443**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404443.zip) | CATT | Draft CR for TS 38.181, On radiated receiver characteristic in clauses10.3 for Ka-band NTN |  |
| [**R4-2404617**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404617.zip) | CATT | Draft CR for TS 38.181, On manufacturer declarations in clause 4.6 for Ka-band NTN |  |
| [**R4-2405555**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405555.zip) | Ericsson, Thales | Draft CR for TS 38.181: FR2 intro in clause 4.1 MUs |  |
| [**R4-2405556**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405556.zip) | Ericsson, Thales | Draft CR for TS 38.181: FR2 intro in clause 4.7 test config |  |
| [**R4-2405557**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405557.zip) | Ericsson, Thales | Draft CR for TS 38.181: FR2 intro in clause 9.4 output power dynamics |  |
| [**R4-2405558**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405558.zip) | Ericsson, Thales | Draft CR for TS 38.181: FR2 intro in clause 9.7.5 spurious emissions |  |

# Recommendations for Tdocs

**Existing tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Source** | **Recommendation** | **Comments** |
| [**R4-2405924**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405924.zip) | Huawei, HiSilicon | See above | Status to be checked in 1st round |
| [**R4-2405925**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405925.zip) | Huawei, HiSilicon | See above | Status to be checked in 1st round |
| [**R4-2404440**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404440.zip) | CATT | See above | Status to be checked in 1st round |
| [**R4-2404441**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404441.zip) | CATT | See above | Status to be checked in 1st round |
| [**R4-2404442**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404442.zip) | CATT | See above | Status to be checked in 1st round |
| [**R4-2404443**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404443.zip) | CATT | See above | Status to be checked in 1st round |
| [**R4-2404617**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404617.zip) | CATT | See above | Status to be checked in 1st round |
| [**R4-2405555**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405555.zip) | Ericsson, Thales | See above | Status to be checked in 1st round |
| [**R4-2405556**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405556.zip) | Ericsson, Thales | See above | Status to be checked in 1st round |
| [**R4-2405557**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405557.zip) | Ericsson, Thales | See above | Status to be checked in 1st round |
| [**R4-2405558**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405558.zip) | Ericsson, Thales | See above | Status to be checked in 1st round |
| R4-2405888 | Ericsson | To return to | It will capture all draft CRs endorsed in this meeting |
| [**R4-2405928**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405928.zip) | Huawei, HiSilicon | Noted |  |
| [**R4-2405929**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2405929.zip) | Huawei, HiSilicon | Noted |  |