**3GPP TSG-RAN WG4 Meeting # 104-e R4-22XXXXX**

**Electronic Meeting, 15– 26 August 2022**

**Agenda item:** 9.11.1, 9.11.2

**Source:** Moderator (THALES)

**Title:** Email discussion summary for [104-e][307] NTN\_Solutions\_SANRF\_Maintenance

**Document for:** Information

# Introduction

This discussion summary document captures general issues and SAN RF maintenance aspects related to RAN4 RF of Rel-17 NR NTN WI related discussion. It contains a summary of the contributions under sections and subsections of Agenda Items 9.11.1, 9.11.2 at TSG-RAN WG4 #104-e, together with identified key open issues and recommends topics/questions to be handled via email discussions. The goal of this document is to provide recommendation on prioritization of discussion.

Please also note the draft TSG-RAN WG4 #104-e meeting agenda with respect to NTN topic:

-------------------------------------- Items led by other working group ----------------------------------------------------

9.11 Solutions for NR to support non-terrestrial networks (NTN) [NR\_NTN\_solutions]

9.11.1 General [NR\_NTN\_solutions-Core]

9.11.2 Satellite Access Node RF requirement maintenance [NR\_NTN\_solutions-Core]

9.11.2.1 TX requirements for radiated characteristics [NR\_NTN\_solutions-Core]

9.11.2.2 RX requirements for radiated characteristics [NR\_NTN\_solutions-Core]

9.11.2.3 Tx requirements for conducted characteristics [NR\_NTN\_solutions-Core]

9.11.2.4 Rx requirements for conducted characteristics [NR\_NTN\_solutions-Core]

9.11.3 Satellite Access Node RF conformance testing [NR\_NTN\_solutions-Perf]

9.11.3.1 General and work plan [NR\_NTN\_solutions-Perf]

9.11.3.1.1 Test Model [NR\_NTN\_solutions-Perf]

9.11.3.1.2 Test configuration [NR\_NTN\_solutions-Perf]

9.11.3.1.3 Others [NR\_NTN\_solutions-Perf]

9.11.3.2 Conductive conformance Testing [NR\_NTN\_solutions-Perf]

9.11.3.2.1 Tx requirements NR\_NTN\_solutions-Perf]

9.11.3.2.2 Rx requirements [NR\_NTN\_solutions-Perf]

9.11.3.2.3 MU assessment [NR\_NTN\_solutions-Perf]

9.11.3.3 Radiated conformance Testing [NR\_NTN\_solutions-Perf]

9.11.3.3.1 Tx requirements [NR\_NTN\_solutions-Perf]

9.11.3.3.2 Rx requirements [NR\_NTN\_solutions-Perf]

9.11.3.3.3 MU assessment [NR\_NTN\_solutions-Perf]

9.11.4 UE RF requirement maintenance [NR\_NTN\_solutions-Core]

9.11.4.1 TX requirements [NR\_NTN\_solutions-Core]

9.11.4.2 RX requirements [NR\_NTN\_solutions-Core]

9.11.5 RRM core requirement maintenance [NR\_NTN\_solutions-Core]

9.11.5.1 Measurement procedure requirements [NR\_NTN\_solutions-Core]

9.11.5.2 Others [NR\_NTN\_solutions-Core]

9.11.6 RRM performance requirements [NR\_NTN\_solutions-Perf]

9.11.6.1 General [NR\_NTN\_solutions-Perf]

9.11.6.2 Test cases for Cell reselection to intra- and inter-frequency neighbor cell [NR\_NTN\_solutions-Perf]

9.11.6.3 Test cases for Intra- and inter-frequency HO with known cell [NR\_NTN\_solutions-Perf]

9.11.6.4 Test cases for Intra- and inter-frequency CHO [NR\_NTN\_solutions-Perf]

9.11.6.5 Test cases for UE transmit timing [NR\_NTN\_solutions-Perf]

9.11.6.6 Test cases for RLM and BFR [NR\_NTN\_solutions-Perf]

9.11.6.7 Test cases for Intra-frequency measurement delay [NR\_NTN\_solutions-Perf]

9.11.6.8 Test cases for Inter-frequency measurement delay [NR\_NTN\_solutions-Perf]

9.11.6.9 Teste cases for L1-RSRP measurement delay [NR\_NTN\_solutions-Perf]

9.11.6.10 Test cases for RRM measurement accuracy [NR\_NTN\_solutions-Perf]

9.11.7 Demodulation requirements [NR\_NTN\_solutions-Perf]

9.11.7.1 General [NR\_NTN\_solutions-Perf]

9.11.7.2 Satellite Access Node demodulation requirements [NR\_NTN\_solutions-Perf]

9.11.7.2.1 PUSCH requirements [NR\_NTN\_solutions-Perf]

9.11.7.2.2 PUCCH requirements [NR\_NTN\_solutions-Perf]

9.11.7.2.3 PRACH requirements [NR\_NTN\_solutions-Perf]

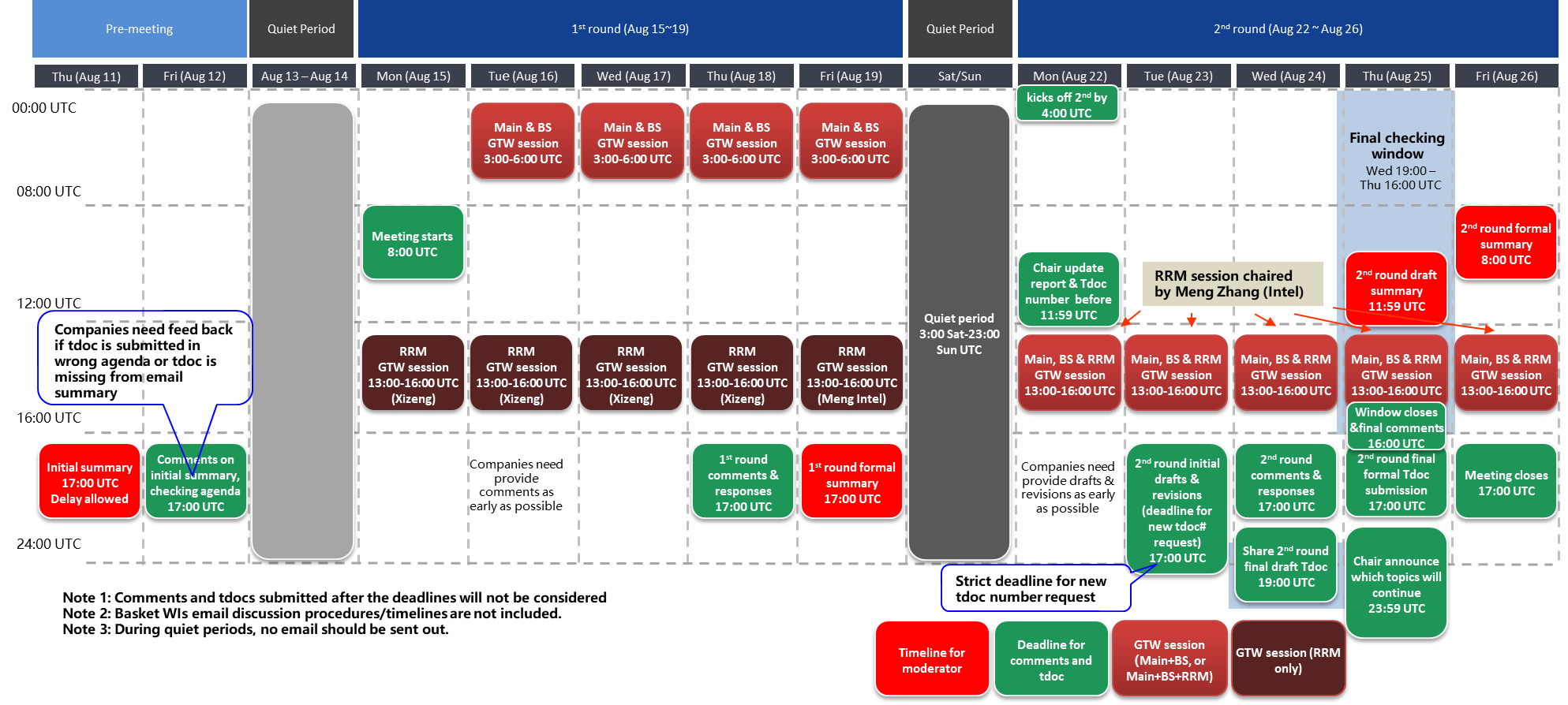
9.11.7.3 UE demodulation requirements [NR\_NTN\_solutions-Perf]

9.11.7.3.1 PDSCH requirements [NR\_NTN\_solutions-Perf]

9.11.8 Moderator summary and conclusions [NR\_NTN\_solutions]

For informative purpose, RAN4#104-e E-meeting Arrangements and Guidelines proposed the following schedule:

[to be updated]



A total of **17** TDocs have been submitted under AIs 9.11.1 and 9.11.2, but only **14** Tdocs have been identified for discussion in **[104-e][307] NTN\_Solutions\_SANRF\_Maintenance** (please also see the **Appendix** for the details, with all the observations/proposals):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***TDoc Number*** | ***TDoc Type*** | ***Title*** | ***Company*** | ***Status*** | ***General Purpose*** | ***Agenda Item*** |
| R4-2211553  (not uploaded) | draftCR | CR for TR 38.861: Regulatory aspects for HAPS | SoftBank Corp. | withdrawn | - | 9.11 |
| R4-2211688  (not uploaded) | draft TS | Draft TS 38.181 v0.1.0 | CATT | reserved | Approval | 9.11.1 |
| [R4-2213361](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213361.zip)  (not to be discussed at RAN4#104-e) | discussion | Discussion on Ka adjacent band NTN-TN NR coexistence scenarios | THALES | available | Information | 9.11.1  (moved to AI 15 – Any other business) |
| [R4-2213207](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213207.zip) | CR | Correction to TR 38.863 on Regulatory aspects for HAPS | Nokia, SoftBank | available | Agreement | 9.11.1 |
| [R4-2213386](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213386.zip) | CR | Correction of OTA ACLR absolute basic limit | THALES | available | Approval | 9.11.2.1 |
| [R4-2213400](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213400.zip) | CR | Correction of OTA extreme conditions | THALES | available | Approval | 9.11.2.1 |
| [R4-2212649](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212649.zip) | CR | CR to TS 38.108 - OTA Tx requirements issues fixes | Ericsson | available | Agreement | 9.11.2.1 |
| [R4-2212651](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212651.zip) | Other | NTN: SAN OTA Tx spurious requirement issue | Ericsson | available | Approval | 9.11.2.1 |
| [R4-2212650](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212650.zip) | CR | CR to TS 38.108 - OTA Rx requirements issues fixes | Ericsson | available | Agreement | 9.11.2.2 |
| [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip) | CR | Correction of OTA receiver spurious emission requirement | THALES | available | Approval | 9.11.2.2 |
| [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip) | CR | Correction of conducted extreme conditions | THALES | available | Approval | 9.11.2.3 |
| [R4-2213157](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213157.zip) | CR | CR for 38.108 to maitain unwanted emissions clause | Huawei, HiSilicon | available | Agreement | 9.11.2.3 |
| [R4-2212647](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212647.zip) | CR | CR to TS 38.108 - conducted Tx requirements issues fixes | Ericsson | available | Agreement | 9.11.2.3 |
| [R4-2214035](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214035.zip) | discussion | Further discussion on requirements for the Extreme conditions testing | Huawei, HiSilicon | available | Discussion | 9.11.2.3 |
| [R4-2214036](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214036.zip) | CR | CR to TS 38.108: removal of NTN SAN output power accuracy requirements for the extreme test conditions, Rel-17 | Huawei, HiSilicon | available | Agreement | 9.11.2.3 |
| [R4-2212648](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212648.zip) | CR | CR to TS 38.108 - conducted Rx requirements issues fixes | Ericsson | available | Agreement | 9.11.2.4 |
| [R4-2213567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213567.zip) | CR | Correction of conducted receiver spurious emission requirement | THALES | available | Approval | 9.11.2.4 |

**Moderator note1:** There is **1 CRs** to TR 38.863 related to HAPS, which the moderator proposes to discuss in the dedicated folders from 1st round and 2nd round.

**Moderator note2:** There are **11 CRs** to TR 38.108 related to SAN, which the moderator proposes to discuss in the dedicated folders from 1st round and 2nd round.

**Moderator note3:** There are **3 Tdocs** for **discussion**, **1 withdrawn** and **1 reserved**.

**Moderator note4:** Following chairman recommendation and guidance with respect to Rel-18 work, Tdoc [R4-2213361](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213361.zip) (Discussion on Ka adjacent band NTN-TN NR coexistence scenarios) has been submitted for information only and moved to Agenda Item AI 15 (Any other business) at RAN4#104-e. Discussions will start during next RAN4 meeting (RAN4#104-bis-e).

Identified topics and issues for the 1st round:

1. Topic #1: General discussions
   1. Issue 1-2-1: SAN OTA Tx spurious requirements(Ericsson)
   2. Issue 1-2-2: SAN requirements for the Extreme conditions testing(Huawei, HiSilicon)
2. Topic #2: Maintenance discussions - CRs to TS 38.108 and TR 38.863
   1. Issue 2-1-1: SAN OTA Tx: ACLR - **see** [R4-2213386](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213386.zip) (THALES)
   2. Issue 2-1-2: SAN OTA Tx: Extreme conditions **– see** [R4-2213400](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213400.zip) (THALES)
   3. Issue 2-1-3: SAN OTA Tx: Requirements issues fixes – **see** [R4-2212649](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212649.zip) (Ericsson)
   4. Issue 2-2-1: SAN OTA Rx: Requirements issues fixes – **see** [R4-2212650](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212650.zip) (Ericsson)
   5. Issue 2-2-2: SAN OTA Rx: Spurious emission requirement **– see** [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip) (THALES)
   6. Issue 2-3-1: SAN Conducted Tx: Extreme conditions **– see** [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip) (THALES)
   7. Issue 2-3-2: SAN Conducted Tx: Unwanted emissions clause - **see** [R4-2213157](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213157.zip) (Huawei, HiSilicon)
   8. Issue 2-3-3: SAN Conducted Tx: Requirements issues fixes – **see** [R4-2212647](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212647.zip) (Ericsson)
   9. Issue 2-3-4: SAN Conducted Tx**:** Extreme conditions **– see** [R4-2214036](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214036.zip) (Huawei, HiSilicon)
   10. Issue 2-4-1: SAN Conducted Rx: Requirements issues fixes – **see** [R4-2212648](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212648.zip) (Ericsson)
   11. Issue 2-4-2: SAN Conducted Rx: Spurious emission requirement **– see** [R4-2213567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213567.zip) (THALES)
   12. Issue 2-5-1: HAPS: Regulatory aspects for HAPS **– see** [R4-2213207](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213207.zip) (Nokia, SoftBank)

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: TBA
* 2nd round: TBA

It is appreciated that the delegates for this topic put their contact information in the table below.

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| THALES | Dorin Panaitopol |  |
| Ericsson | Dominique Everaere | dominique.everaere@ericsson.com |
| Qualcomm | Mustafa Emara | memara@qti.qualcomm.com |
| Nokia | Johannes Hejselbaek | Johannes.hejselbaek@nokia.com |
| Huawei | Peng (Henry) Zhang | zhangpeng169@huawei.com |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)

# Topic #1: General discussions

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2212651](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212651.zip) | Ericsson | **Observation 1: SAN conducted Tx spurious requirement is specified based on the manufacturer declaration parameter** Prated,c,sys **which is specified to SAN*****type 1-H* and not applicable to SAN *type 1-O*.**  **Observation 2: SAN OTA Tx spurious requirement shall be re-specified.**  **Proposal: Specify SAN OTA Tx spurious requirement based on the manufacturer declaration parameter Prated,c,EIRP** |
| [R4-2214035](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214035.zip) | Huawei, HiSilicon | **Observation 1**: consideration of the thermal control system is expected to alleviate the need for the extreme test case for NTN SAN.  **Observation 2**: the temperature range of the NTN SAN is expected to be limited by the thermal control system, and it’s not expected to be as large as for TN deployments.  EUT size shall be considered from the testability perspective. NTN SAN is expected to be of larger dimensions then typical AAS BS. This is expected to cause issues with the EIRP testing in the test chamber under the extreme condition.  **Observation 3**: consideration of the NTN SAN testability in the OTA chamber under extreme test condition is expected to cause testability issues (and the potential need for larger OTA chambers capable of the extreme conditions testing, especially for the extreme temperature test).  **Proposal 1**: Remove SAN output power accuracy requirements for the extreme test conditions from TS 38.108. |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1

*Sub-topic description:* NTN-TN Ka coexistence

*Open issues and candidate options before e-meeting:* Open issues and candidate options not to be discussed at this meeting. Topic moved to AI 15.

### Sub-topic 1-2

*Sub-topic description:* SAN requirements

*Open issues and candidate options before e-meeting:*

**Issue 1-2-1:** SAN OTA Tx spurious requirements

* Proposals
  + Option 1: **Specify SAN OTA Tx spurious requirement based on the manufacturer declaration parameter Prated,c,EIRP**
  + Option 2: TBA
* Recommended WF
  + TBA

**Issue 1-2-2:** SAN requirements for the Extreme conditions testing

* Proposals
  + Option 1: Remove SAN output power accuracy requirements for the extreme test conditions from TS 38.108.
  + Option 2: TBA
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

Sub topic 1-1

**Moderator: N/A at RAN4#104-e**

Sub topic 1-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Issue 1-2-1: SAN OTA Tx spurious requirements  ..  Issue 1-2-2: SAN requirements for the Extreme conditions testing  As commented before the meeting, this issue is pending on the conclusion of the discussion in the conformance thread #308. Once extreme conditions will be clarified and companies will come to an agreement.  .. |
| ZTE | Issue 1-2-1: SAN OTA Tx spurious requirements  .Agree with the proposal from Ericsson since the declaration for SAN type 1-H and SAN type 1-O should be different items.  Issue 1-2-2: SAN requirements for the Extreme conditions testing  As commented by Ericsson that, extreme conditions should be further clarified in the tread 308 and further discuss how to specify it. |
| Qualcomm | Issue 1-2-1: SAN OTA Tx spurious requirements  Just to clarify, should not the “-60 dBm” term be scaled accordingly since we are replacing the rated power for all the TAB connectors for SAN type 1-H with the EIRP for SAN type 1-O. In other words, how to account for the considered SAN antenna gain?  Issue 1-2-2: SAN requirements for the Extreme conditions testing  Agree with E/// comment. Once the agreement on the extreme test conditions is finalized, we can decide upon the output power accuracy requirements. |
| Nokia | Issue 1-2-2: SAN requirements for the Extreme conditions testing  If the “normal test environment” from annex B of 38.141-2, as shown in previous comment, is considered.  Table B.1: Limits of conditions for normal test environment   |  |  |  | | --- | --- | --- | | Condition | Minimum | Maximum | | Barometric pressure | 86 kPa | 106 kPa | | Temperature | 15 °C | 30 °C | | Relative humidity | 20 % | 85 % | | Power supply | Nominal, as declared by the manufacturer | | | Vibration | Negligible | |   The first question to answer might be if we consider the operation in orbit the “normal” environment or that is considered the “extreme” environment. The objective should regardless be to ensure conformance under the operation of the SAN. |
| Huawei | Issue 1-2-1: SAN OTA Tx spurious requirements  Referring to the clause 9.7.5.1, the OTA spurious emissions limits are specified as TRP per RIB. Thus, EIRP in option 1 is not correct for OTA spurious emissions limits. |
| THALES | Issue 1-2-1: SAN OTA Tx spurious requirements  There are actually two equivalent methods, is true (see for instance SM.329-12). However, we need some continuity between OoB definition and spurious. Moreover, Table 2 from SM.329-12 is written “*Attenuation (dB) below the power (W) supplied to the antenna transmission line”*, so the antenna gain should not be taken into account for OTA Tx spurious requirements definition.  For this reason, Huawei comment that OTA spurious emissions limit should be specified as TRP makes sense. To be further discussed with Ericsson.  Issue 1-2-2: SAN requirements for the Extreme conditions testing  Only “normal test environment” should be considered for SAN specification TS 38.108.  Please also check R4-2213434 and R4-2213400 (CRs to TS 38.108 with respect to conducted and OTA extreme conditions for SAN Tx). Extreme testing conditions are normally applicable for (ground) BS testing procedure. However, the definition of extreme testing conditions does not make sense for SAN since these conditions have to be adapted with respect to each system and therefore specific tests will be considered by the manufacturer/SAN vendor with respect to specific operator requirements. For this reason, in both R4-2213434 and R4-2213400 is proposed to remove extreme testing conditions defined for SAN Tx power. |
| CATT | Issue 1-2-1: SAN OTA Tx spurious requirements  Generally, the TRP(**Prated,c,TRP)** is similar to total conducted power （Prated,c,sys）, comparing with TRP(**Prated,c,TRP) ,**  the EIRP (**Prated,c,EIRP)** relax OTA Tx spurious requirement. We prefer to use TRP. |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

**Moderator: N/A**

## Discussion on 2nd round (if applicable)

# Topic #2: Maintenance discussions - CRs to TS 38.108 and TR 38.863

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2213207](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213207.zip) | Nokia, SoftBank | **CR to TR 38.863 to be discussed in the dedicated 1st round & 2nd round folders.**  A clause reference have been corrected. Wording have been corrected to reflect the terminoligy used by ITU and a reference typo have been corrected. |
| [R4-2213386](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213386.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  There is no ACLR absolute basic limit defined for Conducted requirements, only ACLR limit has been defined. For this reason, OTA requirement has to be aligned with conducted requirement. Moreover, currently there are 2 tables, one for SAN GEO class ACLR limit (table 6.6.3.2-1) and one for SAN LEO class ACLR limit (table 6.6.3.2-2), and the proposed changes are minimal since OTA references are included for both ACLR limit tables. |
| [R4-2213400](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213400.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Extreme testing conditions are normally applicable for (ground) BS testing procedure. However, the definition of extreme testing conditions does not make sense for SAN since these conditions have to be adapted with respect to each system and therefore specific tests will be considered by the manufacturer/SAN vendor with respect to specific operator requirements. Therefore, it is proposed to remove extreme OTA testing conditions defined for SAN Tx power. |
| [R4-2212649](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212649.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  “Base station” is still used, while it doesn’t exisit in NTN context.  ACLR absolute limit is still mentioned whil this requirement is not specified for NTN  Tx spurious threshold is 12.75GHz while it was agreed this threshold should be specified as the 5th harmonic  OTA Tx spurious limit refer to the conducted Tx spurious which is specified based on a declaration only valid for type 1-H and not 1-O |
| [R4-2212650](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212650.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Receiver spurious was kept in [] for further discussion while this is an important requirement to guarantee the quality of the SAN design.  All sub-clauses title are not aligned. Similarly, all table titles are not aligned, neither SAN class naming. |
| [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Remove OTA receiver spurious emission requirement since already included in OTA transmission spurious emission requirement. The transmission spurious emission requirement includes both transmission and receiver spurious requirements, as for Satellite Access Node different spurious emissions should not be separated. |
| [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Extreme testing conditions are normally applicable for (ground) BS testing procedure. However, the definition of extreme testing conditions does not make sense for SAN since these conditions have to be adapted with respect to each system and therefore specific tests will be considered by the manufacturer/SAN vendor with respect to specific operator requirements. Therefore, it is proposed to remove extreme testing conditions defined for SAN Tx power. |
| [R4-2213157](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213157.zip) | Huawei, HiSilicon | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Based on the GTW discussion in RAN4#103 meeting, since the spurious emissions within operating band and out of operating band are same, there is no need to specify ΔfOBUE for SAN. Based on ITU-R SM.329, unwanted emissions consist of out-of-band emissions and spurious emissions. It’s recommended to replace operating band unwanted emission by spectrum emission mask in SAN specification. |
| [R4-2212647](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212647.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Some symbols definition are missing.  Base station is still used, some other mistakes remain.  All sub-clauses title are not aligned. |
| [R4-2214036](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214036.zip) | Huawei, HiSilicon | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Based on related motivation paper, in this CR we remove SAN output power accuracy requirements for the extreme test conditions. |
| [R4-2212648](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212648.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Receiver spurious was kept in [] for further discussion while this is an important requirement to guarantee the quality of the SAN design.  All sub-clauses title are not aligned. Similarly, all table titles are not aligned, neither SAN class naming. |
| [R4-2213567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213567.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Remove receiver spurious emission requirement since already included in transmission spurious emission requirement. The transmission spurious emission requirement includes both requirements, as for Satellite Access Node different spurious emissions should not be separated. |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 2-1

*Sub-topic description:* SAN OTA Tx

*Open issues and candidate options before e-meeting:*

1. Issue 2-1-1: SAN OTA Tx: ACLR - **see** [R4-2213386](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213386.zip) (THALES)

**Note:** Correction of OTA ACLR absolute basic limit

1. Issue 2-1-2: SAN OTA Tx: Extreme conditions **– see** [R4-2213400](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213400.zip) (THALES)

**Note:** Correction of OTA extreme conditions

1. Issue 2-1-3: SAN OTA Tx: Requirements issues fixes – **see** [R4-2212649](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212649.zip) (Ericsson)

### Sub-topic 2-2

*Sub-topic description:* SAN OTA Rx

*Open issues and candidate options before e-meeting:*

1. Issue 2-2-1: SAN OTA Rx: Requirements issues fixes – see [R4-2212650](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212650.zip) (Ericsson)
2. Issue 2-2-2: SAN OTA Rx: Spurious emission requirement – see [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip) (THALES)

**Note:** Correction of OTA receiver spurious emission requirement

### Sub-topic 2-3

*Sub-topic description:* SAN Conducted Tx

*Open issues and candidate options before e-meeting:*

1. Issue 2-3-1: SAN Conducted Tx: Extreme conditions – see [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip) (THALES)

**Note:** Correction of conducted extreme conditions

1. Issue 2-3-2: SAN Conducted Tx: Unwanted emissions clause - see [R4-2213157](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213157.zip) (Huawei, HiSilicon)
2. Issue 2-3-3: SAN Conducted Tx: Requirements issues fixes – see [R4-2212647](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212647.zip) (Ericsson)
3. Issue 2-3-4: SAN Conducted Tx: Extreme conditions – see [R4-2214036](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214036.zip) (Huawei, HiSilicon)

### Sub-topic 2-4

*Sub-topic description:* SAN Conducted Rx

*Open issues and candidate options before e-meeting:*

1. Issue 2-4-1: SAN Conducted Rx: Requirements issues fixes – see [R4-2212648](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212648.zip) (Ericsson)
2. Issue 2-4-2: SAN Conducted Rx: Spurious emission requirement – see [R4-2213567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213567.zip) (THALES)

**Note:** Correction of conducted receiver spurious emission requirement

### Sub-topic 2-5

*Sub-topic description:* Regulatory aspects for HAPS

*Open issues and candidate options before e-meeting:*

1. Issue 2-5-1: HAPS: Regulatory aspects for HAPS – see [R4-2213207](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213207.zip) (Nokia, SoftBank)

## Companies views’ collection for 1st round

### Open issues

**Moderator: N/A**

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [R4-2213386](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213386.zip)  (THALES) | Ericsson: see commented CR |
|  | ZTE: Fine with Ericsson’s further update. |
|  | Qualcomm: Proposal to change the text to “The ACLR limit in table 6.6.3.2-1 for GEO class or the ACLR limits in table 6.6.3.2-2 for LEO class shall apply”. |
|  | THALES: Both updates from Ericsson and Qualcomm are fine. The combination between the two comments on top of existent text becomes: “The ACLR limit specified in tables 6.6.3.2-1 for SAN GEO class and 6.6.3.2-2 for SAN LEO class shall apply.”  If not other comments, we propose to accept this version of the CR. |
| [R4-2213400](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213400.zip)  (THALES) | Ericsson: We shall wait for the conclusion on the extreme conditions discussion in the conformance thread#308 |
|  | ZTE: similar comments as Ericsson. |
|  | Qualcomm: Agree with E///. |
|  | CATT: same comment with Ericsson.  THALES: With respect to latest BS RF GTW decisions (on 17/08/2022) we further propose to accept the current version of the CR as it is. |
| [R4-2212649](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212649.zip)  (Ericsson) | Qualcomm: Replace “BS” with SAN in the Prated,c,EIRP definition. |
|  | ZTE: fine with the update and please remove the square bracket for Prated,c,EIRP in Table 9.7.5.2.2-1 |
|  | Huawei: Referring to the clause 9.7.5.1, the OTA spurious emissions limits are specified as TRP per RIB. Thus, EIRP in option 1 is not correct for OTA spurious emissions limits.  “The application of those limits shall be the same as for operating band unwanted emissions in clause 6.6.4.” can be removed. |
|  | THALES: Please see comments in the CR. Some corrections are still required. TBD. |
| [R4-2212650](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212650.zip" \t "_blank)  (Ericsson) | Nokia: OK |
|  | ZTE: for receiver spurious emission requirement, this need more discussion. The current OTA receiver spurious emission is inherited from transmitter Cat B spurious emission requirement since it cannot distinguish the spurious emission from transmitter or receiver in the OTA testing for FDD band if I remember correctly. Currently SAN transmitter requirement has been updated, we think that receiver spurious emission requirement should be also updated accordingly. |
|  | Huawei: The changes of OTA receiver spurious emissions are contradictory to R4-2213431. RAN4 need to discuss whether we need to keep SAN OTA receiver spurious emissions, even if For a SAN operating in FDD, OTA RX spurious emissions requirement do not apply as they are superseded by the OTA TX spurious emissions requirement.  NOTE 3 can be further improved as ΔfOBUE was not defined for SAN. |
|  | THALES: TBD. Please see comments in the CR, also for the values in [].  We should remove OTA receiver spurious emission requirement since already included in OTA transmission spurious emission requirement. The transmission spurious emission requirement includes both transmission and receiver spurious requirements, as for Satellite Access Node different spurious emissions should not be separated. Please also see CR R4-2213431.  Tx spurious and Rx spurious should be considered together in a single “spurious” specification. Since the satellite will Tx and Rx at the same time, they should be considered together.  THALES to Huawei: ΔfOBUE has been defined in 9.7.1-1 |
| [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip)  (THALES) | Ericsson: We don’t agree with this CR, Rx spurious is important requirement to check the quality of the SAN design (even if FDD). We would like to better understand Thales’ concern with such requirement. |
|  | ZTE: similar understanding as Ericsson, the Rx spurious emisison to check its receiver spurious emission performance since we also have lots of active RF components within its Rx chain. |
|  | Qualcomm: It seems that the CR proposes to remove OTA receiver spurious emission requirement since already included in OTA transmission spurious emission requirement, does this mean move the Rx spurious to the Tx spurious section or completely drop the Rx spurious? This needs better clarification. In both cases, having a dedicated section for the Rx spurious is better from consistency and readability point of view. |
|  | Huawei: The changes of OTA receiver spurious emissions are contradictory to R4-2212650. RAN4 need to discuss whether we need to keep SAN OTA receiver spurious emissions, even if For a SAN operating in FDD, OTA RX spurious emissions requirement do not apply as they are superseded by the OTA TX spurious emissions requirement.  CATT: For the core requirements, because SAN is only FDD system, OTA RX spurious emissions requirement do not apply due to FDD. RAN4 to decide whether to keep/remove table Table 10.7.2-1.  THALES: We should remove OTA receiver spurious emission requirement since already included in OTA transmission spurious emission requirement. The transmission spurious emission requirement includes both transmission and receiver spurious requirements, as for Satellite Access Node different spurious emissions should not be separated. Please also see CR R4-2213431.  Tx spurious and Rx spurious should be considered together in a single “spurious” specification. Since the satellite will Tx and Rx at the same time, they should be considered together.  We propose to accept the CR as it is. |
| [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip)  (THALES) | Ericsson: We shall wait for the conclusion on the extreme conditions discussion in the conformance thread#308 |
|  | ZTE: the same understanding as Ercisson., |
|  | THALES: With respect to latest BS RF GTW decisions (on 17/08/2022) we further propose to accept the CR. |
|  |  |
| [R4-2213157](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213157.zip)  (Huawei, HiSilicon) | Nokia. OK |
|  | ZTE:we disagree with the following proposal, otherwsie how to distinguish the in-band emission and out of band spurious emission in the spec.  The definition about ΔfOBUE for SAN was remove |
|  | THALES: To be further discussed.  Not comfortable with proposed changes. |
|  |  |
| [R4-2212647](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212647.zip)  (Ericsson) | Nokia: OK |
|  | ZTE: okay for it. |
|  | Huawei: Ground users can be replaced by users. |
|  | THALES: The phrase does not seem correct. Please check the commented CR. TBD. |
| [R4-2214036](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214036.zip)  (Huawei, HiSilicon) | Ericsson: We shall wait for the conclusion on the extreme conditions discussion in the conformance thread#308 |
|  | ZTE: the same understanding as Ercisson., |
|  | Qualcomm: Agree with E/// comments. |
|  | THALES: The extreme conditions have been removed from Rel-17, so therefore contribution is fine. **Note:** The contribution has been submitted in Conducted Tx Agenda Item but it contains both Conducted and OTA Tx information. There is also an overlap with [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip" \t "_blank) (conducted Tx requirement) and [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip" \t "_blank) (OTA Tx requirement). |
| [R4-2212648](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212648.zip)  (Ericsson) | Nokia: OK |
|  | ZTE: Okay for it. For Receiver spuirous emission, it might need more discussions. |
|  | Huawei:  The following sentence can be added to clarify this case.  “For *antenna connectors* / *TAB connectors* supporting both RX and TX in FDD, the RX spurious emissions requirements are superseded by the TX spurious emissions requirements, as specified in clause 6.6.5.”  NOTE 3 can be further improved as ΔfOBUE was not defined for SAN.  The changes of OTA receiver spurious emissions are contradictory to R4-2213567. |
|  | THALES: In R4-2213567 we proposed contribution not to include Rx Spurious emission requirement. R4-2213567 should be further discussed. Also, during RAN4#103-e we provided comments not to include this Rx spurious requirement for SAN. |
| [R4-2213567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213567.zip" \t "_blank)  (THALES) | Ericsson: We don’t agree with this CR, Rx spurious is important requirement to check the quality of the SAN design (even if FDD). We would like to better understand Thales’ concern with such requirement. |
|  | ZTE: similar understanding as Ericsson, the Rx spurious emisison to check its receiver spurious emission performance since we also have lots of active RF components within its Rx chain. |
|  | Qualcomm: Similar to the OTA CR, It seems that the CR proposes to remove conducted receiver spurious emission requirement since already included in the conducted transmission spurious emission requirement, does this mean move the Rx spurious to the Tx spurious section or completely drop the Rx spurious? |
|  | Nokia: We are not sure why this requirement is removed again after it were originally included.  Huawei: The changes of OTA receiver spurious emissions are contradictory to R4-2212648.  CATT: we don’t think this section should be removed in conducted test.  THALES 1 to Huawei: True, for this reason R4-2212648 should not be accepted.  THALES 1 to NOKIA: This requirement was not originally included, during RAN4#103-e we provided comments not to include this requirement.  THALES 3: The Tdoc proposes to remove receiver spurious emission requirement since already included in transmission spurious emission requirement. The transmission spurious emission requirement includes both requirements, as for Satellite Access Node different spurious emissions should not be separated.  The “Tx” and “Rx” spurious emissions should be considered together, in a single requirement. At least in the case of the satellite is unusual to consider them separated. |
| [R4-2213207](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213207.zip)  (Nokia, SoftBank) | Qualcomm: Typo in the first change in section 5.3 “IMT base”.  Huawei: In the first sentence of clause 5.3, the first change “stations” can be kept. |
|  | Nokia: Thank you for the corrections. A revision has been uploaded to the draft folder. |
|  |  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
|  | WF on … | YYY |  |
|  | LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |  |

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-22xxxxx |  | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-22xxxxx |  | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Appendix: Companies contribution summary

Contribution summaries for **[104-e][307] NTN\_Solutions\_SANRF\_Maintenance** thread are as follows:

|  |  |  |
| --- | --- | --- |
| **TDoc Number** | **Company** | **Proposals / Observations** |
| R4-2211553  (not uploaded) | SoftBank Corp. | **N/A** |
| R4-2211688  (not uploaded) | CATT | **N/A** |
| [R4-2213361](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213361.zip)  (Submitted for information only, moved to AI 15, not to be discussed at this meeting) | THALES | **Observation 1:** Based on the current range, some part of the satellite service allocated frequency bands for both GEO and NGSO fall outside of the FR1 and FR2 range. As shown in the diagram below, these include:  Ka UL   * Ka Band DL * Ku Band UL and DL   **Illustration of FR1, FR2, bands**  **Observation 2:** The Harmonized Satellite Ka band refers to [17.7 – 20.2 GHz] on the downlink and [27.5 – 30.0 GHz] on the uplink.  **Proposal 1:** RAN4 shall consider FDD harmonized Satellite Ka band (17.7 – 20.2 GHz on the downlink, and 27.5 – 30.0 GHz on the uplink) for coexistence analysis with TDD TN n258 (24.250 - 27.5 GHz).  **Proposal 2:** RAN4 shall focus on FDD UL 27.5 – 30.0 GHz NTN coexistence analysis with TDD TN n258 (24.250 - 27.5 GHz).  **Proposal 3:** RAN4 shall focus on Ka coexistence analysis using dense urban and urban macro scenarios.  **Proposal 4:** RAN4 shall focus on Ka coexistence analysis with LEO 600km and GEO constellations.  **Proposal 5:** RAN4 shall consider the following table for co-existence studies in Ka band:  **Table x. TN-NTN coexistence scenarios in adjacent bands for Ka-band**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **No.** | **NTN Frequency** | **TN Frequency** | **TN scenario** | **NTN** | | **1** | 27.5 GHz-30 GHz | NR n258 (24.250 - 27.5 GHz) | Dense urban | GEO | | **2** | 27.5 GHz-30 GHz | NR n258 (24.250 - 27.5 GHz) | Dense urban | LEO@600km | | **3** | 27.5 GHz-30 GHz | NR n258 (24.250 - 27.5 GHz) | Urban macro | GEO | | **4** | 27.5 GHz-30 GHz | NR n258 (24.250 - 27.5 GHz) | Urban macro | LEO@600km |   **Proposal 6:** RAN4 shall consider the following figure for co-existence studies in Ka band:  **cid:image010.png@01D71744.932A31F0**  **Figure x. Different interference scenarios in Ka adjacent bands between NTN 5G NR and TN 5G NR**  **Observation 3:** It can be noted that for FR2, coexistence scenarios will be much simpler than for FR1, because the NTN-TN scenarios for FR2 are limited only to i1 (DL TN in UL NTN), i2 (UL NTN in DL TN), i3 (UL NTN in UL TN).  **Observation 4:** FR2 coexistence studies could be further down-scoped by deprioritizing NTN-NTN coexistence as well as dense urban scenarios. |
| [R4-2213207](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213207.zip) | Nokia, SoftBank | **CR to TR 38.863 to be discussed in the dedicated 1st round & 2nd round folders.**  A clause reference have been corrected. Wording have been corrected to reflect the terminoligy used by ITU and a reference typo have been corrected. |
| [R4-2213386](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213386.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  There is no ACLR absolute basic limit defined for Conducted requirements, only ACLR limit has been defined. For this reason, OTA requirement has to be aligned with conducted requirement. Moreover, currently there are 2 tables, one for SAN GEO class ACLR limit (table 6.6.3.2-1) and one for SAN LEO class ACLR limit (table 6.6.3.2-2), and the proposed changes are minimal since OTA references are included for both ACLR limit tables. |
| [R4-2213400](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213400.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Extreme testing conditions are normally applicable for (ground) BS testing procedure. However, the definition of extreme testing conditions does not make sense for SAN since these conditions have to be adapted with respect to each system and therefore specific tests will be considered by the manufacturer/SAN vendor with respect to specific operator requirements. Therefore, it is proposed to remove extreme OTA testing conditions defined for SAN Tx power. |
| [R4-2212649](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212649.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  “Base station” is still used, while it doesn’t exisit in NTN context.  ACLR absolute limit is still mentioned whil this requirement is not specified for NTN  Tx spurious threshold is 12.75GHz while it was agreed this threshold should be specified as the 5th harmonic  OTA Tx spurious limit refer to the conducted Tx spurious which is specified based on a declaration only valid for type 1-H and not 1-O |
| [R4-2212651](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212651.zip) | Ericsson | **Observation 1: SAN conducted Tx spurious requirement is specified based on the manufacturer declaration parameter** Prated,c,sys **which is specified to SAN*****type 1-H* and not applicable to SAN *type 1-O*.**  **Observation 2: SAN OTA Tx spurious requirement shall be re-specified.**  Proposal: Specify SAN OTA Tx spurious requirement based on the manufacturer declaration parameter Prated,c,EIRP |
| [R4-2212650](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212650.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Receiver spurious was kept in [] for further discussion while this is an important requirement to guarantee the quality of the SAN design.  All sub-clauses title are not aligned. Similarly, all table titles are not aligned, neither SAN class naming. |
| [R4-2213431](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213431.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Remove OTA receiver spurious emission requirement since already included in OTA transmission spurious emission requirement. The transmission spurious emission requirement includes both transmission and receiver spurious requirements, as for Satellite Access Node different spurious emissions should not be separated. |
| [R4-2213434](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213434.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Extreme testing conditions are normally applicable for (ground) BS testing procedure. However, the definition of extreme testing conditions does not make sense for SAN since these conditions have to be adapted with respect to each system and therefore specific tests will be considered by the manufacturer/SAN vendor with respect to specific operator requirements. Therefore, it is proposed to remove extreme testing conditions defined for SAN Tx power. |
| [R4-2213157](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213157.zip) | Huawei, HiSilicon | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Based on the GTW discussion in RAN4#103 meeting, since the spurious emissions within operating band and out of operating band are same, there is no need to specify ΔfOBUE for SAN. Based on ITU-R SM.329, unwanted emissions consist of out-of-band emissions and spurious emissions. It’s recommended to replace operating band unwanted emission by spectrum emission mask in SAN specification. |
| [R4-2212647](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212647.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Some symbols definition are missing.  Base station is still used, some other mistakes remain.  All sub-clauses title are not aligned. |
| [R4-2214035](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214035.zip) | Huawei, HiSilicon | **Observation 1**: consideration of the thermal control system is expected to alleviate the need for the extreme test case for NTN SAN.  **Observation 2**: the temperature range of the NTN SAN is expected to be limited by the thermal control system, and it’s not expected to be as large as for TN deployments.  EUT size shall be considered from the testability perspective. NTN SAN is expected to be of larger dimensions then typical AAS BS. This is expected to cause issues with the EIRP testing in the test chamber under the extreme condition.  **Observation 3**: consideration of the NTN SAN testability in the OTA chamber under extreme test condition is expected to cause testability issues (and the potential need for larger OTA chambers capable of the extreme conditions testing, especially for the extreme temperature test).  **Proposal 1**: Remove SAN output power accuracy requirements for the extreme test conditions from TS 38.108. |
| [R4-2214036](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214036.zip) | Huawei, HiSilicon | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Based on related motivation paper, in this CR we remove SAN output power accuracy requirements for the extreme test conditions. |
| [R4-2212648](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212648.zip) | Ericsson | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Receiver spurious was kept in [] for further discussion while this is an important requirement to guarantee the quality of the SAN design.  All sub-clauses title are not aligned. Similarly, all table titles are not aligned, neither SAN class naming. |
| [R4-2213567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213567.zip) | THALES | **CR to TS 38.108 to be discussed in the dedicated 1st round & 2nd round folders.**  Remove receiver spurious emission requirement since already included in transmission spurious emission requirement. The transmission spurious emission requirement includes both requirements, as for Satellite Access Node different spurious emissions should not be separated. |