**3GPP TSG-RAN WG4 Meeting #116 R4-2511448**

**Bengaluru, India, August 25th – 29th, 2025**

**Agenda item:** 4.1.3

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [116][301] BSRF\_Maintenance\_TEI

**Document for:** Information

# Introduction

The scope of this topic summary is BS RF maintenance agenda items. Topics are divided according to the agenda:

**Up to Rel-17 maintenance for LTE and NR and TEI:**

1. BS RF requirements and BS conformance testing (4.3)

Rel-16/17 TEI and others (EMC, OTA, and TRP/TRS) (4.6) ***(No Tdocs)***

**Rel-18 and Rel-19 maintenance for LTE and NR, TEI18 and TEI19:**

Rel-19 spectrum related WI maintenance:  
New bands for LTE based 5G terrestrial broadcast for early deployments (5.3.6) ***(No Tdocs)***

1. NR NTN enhancements:  
   System parameters and UE RF requirements (5.17.1)
2. Rel-18 and Rel-19 non-spectrum related WIs:  
   BS/SAN/non-UE RF requirements (5.28.2)
3. Rel-18 TEI:  
   BS RF, demodulation performance and other topics (5.29.3)

Rel-19 TEI:  
BS RF, demodulation performance and other topics (5.30.3) ***(No Tdocs)***

**RAN task and other topics:**

1. Framework simplification for co-location/co-existence requirements (10.1)

# Topic #1: BS RF requirements and BS conformance testing (up to Rel-17) (4.3)

## Companies’ contributions summary

**Submitted CRs (Cat A CRs not listed)**

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of change** |
| R4-2509353 | CATT | (NR\_NTN\_solutions-Core)CR for TS38.108, Add SAN type 1-H for OTA sensitivity requirement  **Summary of change:** Add SAN type 1-H for OTA sensitivity in sub-clause 10.2.2. |
| R4-2509367 | CATT | (NR\_NTN\_solutions-Perf) CR for TS 38.181, Correction on term of SAN performance requirements  **Summary of change:** To correct the term of SAN in Clause 7.5, 8.4, 9.4, |
| R4-2510230 | Ericsson | (NR\_6GHz) CR to TS 38.104: Correction of requirement parameter for band n104 in Clause 10.3.2  **Summary of change:**   1. In Table 10.3.2-1a, changed to “OTA reference sensitivity level, EISREFSENS” 2. In Table 10.3.2-2a, changed to “OTA reference sensitivity level, EISREFSENS” 3. In Table 10.3.2-3a, changed to “OTA reference sensitivity level, EISREFSENS” |
| R4-2511294 (revised to  R4-2511657) | Huawei, HiSilicon | (NR\_6GHz\_unlic\_EU-Perf) CR to 38.141-2 correction on spurious emission test limits for n102  **Summary of change:** Correct the band range for n102 in the co-existence and co-location table. |
| R4-2511297 | Huawei, HiSilicon, Ericsson, ZTE, Samsung, CATT, Nokia | (NR\_6GHz-Core) CR to 38.104 correction on the band definition for n104  **Summary of change:** Note 8 in Table 5.2-1 is removed. |
| R4-2511303 | Huawei, HiSilicon | (AASenh\_BS\_LTE\_UTRA-Core) CR to 37.105: Additional co-location requiremen for BC1 and BC2  **Summary of change:** Reffering to 37.141, the frequency offsets are added. |

# Topic #2: NR NTN enhancements; System parameters and UE RF requirements (5.17.1)

## Companies’ contributions summary

**Submitted CRs (Cat A CRs not listed)**

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of change** |
| R4-2509815 | Xiaomi | (NR\_NTN\_enh-Core) CR for TS 38.101-5: Correction for VSAT type, CAT-F R18  **Summary of change:** Replace “UE Type” termimology to “NTN VSAT type”. |
| R4-2510669 | LG Electronics | (NR\_NTN\_enh-Core) CR on phase continuity requirements for DMRS bundling  **Summary of change:** Add “UE specific TA and common TA do not update.” in NTN-specific condition on 6.4.2.2  NOTE: *Clauses affected* missing on CR cover page. |
| R4-2511370 | THALES | (NR\_NTN\_enh-Core) Maintenance CR to TS 38.101-5 – Min Peak EIRP value for NTN UE in Ka-band – Cat F CR  **Summary of change:** Introduction of a Note to explain the applicability of min peak EIRP value.  NOTE: Cat A CR is submitted and uploaded before the meeting. |
| R4-2511496 | THALES | (NR\_NTN\_enh-Core) Maintenance – Max Peak EIRP value for NTN UE in Ka-band – Cat F CR  **Summary of change:** Introduction of scaling factor to explain max peak EIRP value for different transmission bandwidths.  NOTE: Cat A CR is submitted and uploaded before the meeting. |

# Topic #3: Rel-18 and Rel-19 non-spectrum related WIs; BS/SAN/non-UE RF requirements (5.28.2)

## Companies’ contributions summary

**Submitted CRs (Cat A CRs not listed)**

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| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of change** |
| R4-2509185 | Nokia, Union Inter. Chemins de Fer | (NR\_FR1\_lessthan\_5MHz\_BW-Perf) CR to TS 38.141-1: Transmit power for 3MHz CBW in band n100  **Summary of change:** Addition of the output power restrictions for 3MHz CBW in band n100. |
| R4-2509370 | CATT | (NR\_NTN\_enh-Core) CR to 38.108, Correction on term of SAN channel bandwidth for FR2 ACLR requirements  **Summary of change:** To correct the term of SAN BWChannel and BWConfig in Clause 9.7 |
| R4-2509372 | CATT | (LTE\_NBIOT\_eMTC\_NTN\_req) CR for TS 36.181, Correction on SAN diagram  **Summary of change:** To correct the SAN diagrams in Clause 4.2 |
| R4-2509373 | CATT | (LTE\_NBIOT\_eMTC\_NTN\_req) CR for TS 36.108, Correction on SAN diagram  **Summary of change:** To correct the SAN diagrams in Clause 4.3 |
| R4-2511274 | Nokia | CR to 36.104 on missing Band 47 note  **Summary of change:** Note is added to align with 36.101. |

# Topic #4: Rel-18 TEI: BS RF, demodulation performance and other topics (5.29.3)

## Companies’ contributions summary

**Discussion papers**

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title/Proposals** |
| R4-2509347 | CATT | Discussion on reference sensitivity levels requirement apply to SAN that supports NB-IoT operation in NTN NR in-band  **Proposal 1:** Update PREFSENS for 20MHz CBW and 15kHz SCS with G-FR1-NTN-A1-11 (Note 4) in TS 38.108 from -92.3 to -92.9. |

**Submitted CRs (Cat A CRs not listed)**

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| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of change** |
| R4-2509348 | CATT | (TEI18)CR for TS38.108, Correction on reference sensitivity levels requirement apply to SAN that supports NB-IoT operation in NTN NR in-band[NTNNBIoT\_inbandNTNNR]  **Summary of change:** Change PREFSENS for 20MHz CBW and 15kHz SCS with G-FR1-NTN-A1-11 (Note 4) from -92.3 to -92.9. |
| R4-2509365 | CATT | (TEI18) CR for 38.108, Correction on SAN channel bandwidth [NTNNBIoT\_inbandNTNNR]  **Summary of change:** To correct the SAN channel bandwidth for NB-IoT operation in NTN NR in-band in Clause 3, 6.3, 7.3, 7.5, 7.8, 9.4, 10.4, 10.9 |
| R4-2509733 (revised to  R4-2511666) | Nokia, Echostar, Viasat, Ericsson, MediaTek, Huawei | (TEI18) CR to 36.102 related to Demodulation for NB-IoT NTN inband operation with NR NTN (LTE\_NBIOT\_eMTC\_NTN)  **Summary of change:** Change of some titles in clause 8.3.1.1.1 and A.1.1.1 and addition of a note. |
| R4-2511545 | Huawei, HiSilicon | (TEI18) CR to TS 38.104: correction of OTA Tx IMD wanted signal characteristics [OTA Tx IMD signal]  **Summary of change:** OTA Tx Intermodulation requirement correction and inconsistency removal. |

R4-2509365 a revision is needed.

# Topic #5: Framework simplification for co-location/co-existence requirements (10.1)

## Companies’ contributions summary

**Discussion papers**

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title/Proposals** |
| R4-2509341 | CATT | Further discussion on framework simplification for co-location/co-existence requirements  **Observation 1:** The following table can be used to simplify the co-existence requirement in TS 38.104. < Table 6.6.5.2.3-1: BS spurious emissions basic limits for BS for co-existence with systems operating in other frequency bands>  **Observation 2:** Don’t remove the existing co-existence/co-location requirement, and adding co-existence/co-location requirement for Other co-existence system type not listed above in end of co-existence requirement table can reduce significant number of CRs when new frequency band is introduced. For this approach to simplify co-existence/co-location requirement, we do not need to delete existing notes in the co-existence and co-location requirement clauses. A example is shown as below: < Table 6.6.5.2.3-1: BS spurious emissions basic limits for BS for co-existence with systems operating in other frequency bands |
| R4-2510827 | Ericsson | Discussion on simplification of tables with requirements for co-existence and co-location  **Observation1:** A new Annex X in TS 37.104 is an acceptable way fwd for us to solve the issue of describing the frequency range for different operating bands. A proposal is attached at the end of this document.  **Proposal 1:** In some cases (e.g. TS 37.105, TS 36.104) we need to delete 3 tables (e.g for WA, MR and LA) while introducing a new one with all the information. In this case the present table description will be set to “void” and a new table will be introduced.  **Proposal 2:** In some specification the Out-of-band blocking requirements for co-location need to be compressed as well in one table. This aspect was not mentioned in the WF. See proposals in R4-2510829 and -30.  **Proposal 3:** Use the proposal in R4-2508759 as the reference for implementation.  **Proposal 4:** Simplify the Blocking requirements for co-location following the template used in TS 38.104 clause 7.5.3 (Conducted) and 10.6.2 (OTA) |
| R4-2511563 | Huawei, HiSilicon | Further discussion on open issues related to the implementation of framework simplification for co-location/co-existence requirements  **Proposal 1**: Before proceeding with the implementation of CRs, the following open issues are to be resolved: - How to reassure that all notes deleted from the legacy tables are properly reflected in new table format.  - How to reassure that unnecessary co-location requirements are NOT unintentionally added with this new framework, e.g., IMT BS and FRMCS BS, IMT BS and broadcasting BS, V2X, Unlicensed bands, etc.  - How to reassure that unnecessary co-existence requirements are NOT unintentionally added with this new framework. - Proposed solution needs to be 6G-ready, so that introduction of new RAT generation would not introduce new burden.  **Proposal 2:** Before proceeding with formal CRs the following steps need to be taken:  1: Agree on full and complete solution to proceed with, 2: Based on the agreed solution, provide a full set of Draft CRs to all considered specifications (~15 specs), at least one meeting cycle before the final CRs are targeted. NOTE: please note, that each of the considered specifications captures slightly different table content, i.e., it is not copy-paste process to generate 15 CRs to affected specifications.  3: Only then proceed with the final CRs, as a package.  **Proposal 3:** A new annex (as previously proposed for TS 37.104) containing frequency bands which are subject to co ex/co-location requirements shall not be referred from another specification, as it would conflict with previous agreement (i.e., not to refer to another specification).  **Proposal 4:** RAN4 to re-consider the idea of a new spec capturing all co-ex and co-location requirements, as it has the following advantages:  - Ease of implementation, i.e., 1-to-1 copy-paste of the requirements from legacy specifications to dedicated clause within the new spec, - error prone approach, with no risk of modifying the existing requirements during this work (as it is copy-paste),  - overall benefit of 1 CR required to address all co-ex and co-location requirements for any new band in future (as opposed to the currently investigated approach, which does NOT guarantee that), - allows future optimisation and alignment of all tables captured (which is exactly what we are trying to do under unnecessary time pressure),  - no time pressure due to simplicity of such new spec implementation. |

**Submitted CRs (Cat A CRs not listed)**

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| **T-doc number** | **Company** | **Title / Summary of change** |
| R4-2509342 (revised to  R4-2511658 and R4-2511659) | CATT | CR for 38.106, on framework simplification for co-location/co-existence requirement  **Summary of change:** 1) Add simplified co-existence spurious requirement in Table 6.5.4.2.2-1. 2) Add simplified co-location spurious requirement in Table 6.5.4.2.3-1. |
| R4-2509343 (revised to  R4-2511698) | CATT | CR for 38.174, on framework simplification for co-location/co-existence requirement  **Summary of change:** 1) Add simplified co-existence spurious requirement in Table 6.6.5.2.2-1. 2) Add simplified co-location spurious requirement in Table 6.6.5.2.3-1. |
| R4-2509344 (revised to  R4-2511660) | CATT | CR for 37.145-1, on framework simplification for co-location/co-existence requirement  **Summary of change:** 1) Add simplified co-existence spurious requirement in Table 6.6.6.5.2.5-1. 2) Add simplified co-location spurious requirement in Table 6.6.6.5.2.6-1. 3) Add simplified blocking co-location requirement for MSR in Table 7.5.5.1.2-1. 4) Add simplified blocking co-location requirement for single RAT UTRA FDD operation in Table 7.5.5.2-4. 5) Add simplified blocking co-location requirement for single RAT UTRA TDD 1,28 Mcps option operation in Table 7.5.5.3.2-1. 6) Add simplified blocking co-location requirement for single RAT E-UTRA operation in Table 7.5.5.4.2-1. |
| R4-2509345 (revised to  R4-2511661) | CATT | CR for 36.106, on framework simplification for co-location/co-existence requirement  **Summary of change:** 1) Add simplified co-existence spurious requirement in Table 9.2.2.1-1. 2) Add simplified co-location spurious requirement in Table 9.2.3.1-1. |
| R4-2509415 (revised to  R4-2511662) | Nokia | (TEI19) CR to 36.141 on framework simplification for co-location/co-existence requirements  **Summary of change:** Relevant Clauses are updated. |
| R4-2509416 (revised to  R4-2511663) | Nokia | (TEI19) CR to 37.104 on framework simplification for co-location/co-existence requirements  **Summary of change:** Relevant Clauses are updated. |
| R4-2509417 (revised to  R4-2511664) | Nokia | (TEI19) CR to 38.141-1 on framework simplification for co-location/co-existence requirements  **Summary of change:** Relevant Clauses are updated. |
| R4-2510828 (revised to  R4-2511674) | Ericsson | CR to TS 38.104: Simplification of tables for additional spurious emission requirements for co-existence and co-location  **Summary of change:** The tables are restructured to include the general requirement level and exceptions. |
| R4-2510829 (revised to  R4-2511675 and R5-2512817) | Ericsson | CR to TS 37.105: Simplification of tables for additional requirements for co-existence and co-location  **Summary of change:** The tables are restructured to include the general requirement level and exceptions. |
| R4-2510830 (revised to  R4-2511676) | Ericsson | CR to TS 36.104: Simplification of tables for additional requirements for co-existence and co-location  **Summary of change:** The tables are restructured to include the general requirement level and exceptions. |
| R4-2511144 (revised to  R4-2511677) | ZTE Corporation | (TEI19) CR to TS 38.115-1 spec structure simplification for co-location co-existence requirements  **Summary of change:** The table is simplified to include the general requirement level and exceptions. |
| R4-2511145 (revised to  R4-2511678) | ZTE Corporation | (TEI19) CR to TS 38.176-1: spec structure simplification for co-location co-existence requirements  **Summary of change:** The tables are restructured to include the general requirement level and exceptions. |
| R4-2511146 (revised to  R4-2511679) | ZTE Corporation | (TEI19) CR to TS 38.176-2 spec structure simplification for co-location/co-existence requirements  **Summary of change:** The table is simplified to include the general requirement level. |
| R4-2511147 (revised to  R4-2511680) | ZTE Corporation | (TEI19) CR to TS 37.141: spec structure simplification for co-location/co-existence requirements  **Summary of change:** The table is simplified to include the general requirement level and exceptions. |
| R4-2511564 | Huawei, HiSilicon | (TEI19) Draft CR to TS 38-141-2: simplification of co-location and co-existence requirement tables [co-ex/co-lo]  **Summary of change:** Placeholder introduction for the (potential) new simplified co-ex and co-location requirement tables. |
| R4-2511565 | Huawei, HiSilicon | (TEI19) Draft CR to TS 37.145-2: simplification of co-location and co-existence requirement tables [co-ex/co-lo]  **Summary of change:** Placeholder introduction for the (potential) new simplified co-ex and co-location requirement tables. |
| R4-2511566 | Huawei, HiSilicon | (TEI19) Draft CR to TS 36.143: simplification of co-location and co-existence requirement tables [co-ex/co-lo]  **Summary of change:** Placeholder introduction for the (potential) new simplified co-ex and co-location requirement tables. |

## Open issues summary

### Sub-topic 5-1 - Framework simplification for co-location/co-existence requirements

**Issue 5-1-1: Principle for simplification**

* Options based on proposals
  + Option 1: Maintain tables for co-existence and co-location in each specification but simplify them (as in the agreed WF in R4-2504741)
  + Option 2: Re-consider the idea of a new spec capturing all co-ex and co-location requirements
* Recommended WF
  + TBA

Huawei: We can jump directly to details of option 1. Option 2 was submitted as fallback if option 1 doesn’t fly.

**Issue 5-1-2: How to handle table entries for existing non-GSM systems and bands.**

* Options based on proposals and CRs
  + Option 1: Replace existing co-ex/co-location limits for non-GSM systems with a generic “other system type entry”.
  + Option 2: Keep existing entries for co-ex/co-location limits for non-GSM systems and add a generic “other system type entry” applicable to new bands only.
* Recommended WF
  + TBA

CATT: Just add new entry for new bands.

Huawei: Lets keep this approach as fallback, if the combined table structure dint work.

CATT: We can discuss them in parallel.

Nokia: Not sure what this approach would mean. In the last meeting we discussed this option. It was agreed to have common entry for requirement levels instead of repeat for all bands.

Huawei: We agreed to simplification of table.

Nokia: CR for 38.104 is based on discussion from last meeting. It would be good to agree to CRs as soon as possible to benefit of new structures when bands are introduced.

Agreement: The update applies to both conducted and OTA requirements.

**Issue 5-1-3: New Annex in 37.104**

* Options based on proposals
  + Option 1: New Annex in 37.104 as reference for operating band frequency ranges.
  + Option 2: No new Annex in 37.104 to be referenced.
* Recommended WF
  + TBA

Agreement: Follow option 2, Not introduce Annex to MSR spec.

**Issue 5-1-4: Other proposals given in discussion papers**

* The following proposals given in discussion papers are independent:
  + Proposal 1 in R4-25108271: In some cases (e.g. TS 37.105, TS 36.104) we need to delete 3 tables (e.g for WA, MR and LA) while introducing a new one with all the information. In this case the present table description will be set to “void” and a new table will be introduced.

Nokia: We have submitted a draft with an example.

Ericsson: According to drafting rules, we need to void the whole table and introduce a new table with common levels.

Huawei: If we remove table, we need to check that the old table is not referred anywhere.

Agreement:

For the scenario where we have separate tables for BS classes, void old tables and introduce new common table for all the classes. Check reference for old tables, if needed update references.

* + Proposal 2 in R4-2510827: In some specification the Out-of-band blocking requirements for co-location need to be compressed as well in one table. This aspect was not mentioned in the WF. See proposals in R4-2510829 and -30.

Nokia: In NR specification we have already adopted new approach. We could use the same for all other specs too.

Agreement: For out-of-band blocking adopt the same approach as used for NR for co-location requirements.

* + Proposal 3 in R4-2510827: Use the proposal in R4-2508759 as the reference for implementation.
  + Proposal 4 in R4-2510827: Simplify the Blocking requirements for co-location following the template used in TS 38.104 clause 7.5.3 (Conducted) and 10.6.2 (OTA).
  + Proposal 1 in R4-2511563: Before proceeding with the implementation of CRs, the following open issues are to be resolved:
    - How to reassure that all notes deleted from the legacy tables are properly reflected in new table format.
    - How to reassure that unnecessary co-location requirements are NOT unintentionally added with this new framework, e.g., IMT BS and FRMCS BS, IMT BS and broadcasting BS, V2X, Unlicensed bands, etc.
    - How to reassure that unnecessary co-existence requirements are NOT unintentionally added with this new framework.
    - Proposed solution needs to be 6G-ready, so that introduction of new RAT generation would not introduce new burden.

Agreement: Special exception related to specific bands needs to be captured as notes under the new table (e.g., IMT BS and FRMCS BS, IMT BS and broadcasting BS, V2X, Unlicensed bands, etc.).

* + Proposal 2 in R4-2511563: Before proceeding with formal CRs the following steps need to be taken:

1: Agree on full and complete solution to proceed with,

2: Based on the agreed solution, provide a full set of Draft CRs to all considered specifications (~15 specs), at least one meeting cycle before the final CRs are targeted.

NOTE: please note, that each of the considered specifications captures slightly different table content, i.e., it is not copy-paste process to generate 15 CRs to affected specifications.

3: Only then proceed with the final CRs, as a package.

Huawei: This meeting we agree on sub-set and next meeting (November) to collect full set of CRs to all specifications.

Workplan;

* This meeting review baseline CRs (if possible endorse)
* Next meeting collect draft CRs for full package (Endorse draft CR)
* Approve formal CRs for the complete package in November. Formally to be presented at RAN plenary in December.

Add work split in WF

* Recommended WF
  + TBA

Ericsson: We have input contribution on blocking impact.

Agreement: Adopt the approach exemplified in R4-2509416 and R4-2509417 as baseline for spurious emission coexistence, co-location spurious emission and co-location blocking requirements.

Moderator guidance:

Review this week, provide comments. If possible, update and try to endorse.