**3GPP TSG-RAN WG4 Meeting # 109 R4-2318193**

**Chicago, USA, November 13 – November 17, 2023**

**Agenda item:** 6.4

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [109][301] BSRF\_Maintenance

**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-16 maintenance for LTE and NR:**

1. BS RF requirements and BS conformance testing (4.2)

**Rel-17 maintenance for LTE and NR:**

1. BS RF requirements and BS conformance testing (5.2.2)

**Rel-18 maintenance for LTE and NR:**

1. BS RF requirements (*no Tdocs*) (6.2.2)

# Topic #1: BS RF requirements and BS conformance testing (up to Rel-16) (4.2)

## Companies’ contributions summary

**Discussion papers**

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title/Proposals** |
| R4-2318288 | CATT | Discussion on reference of PREFSENS  **Proposal 1:** For NR, PREFSENS in TS 38.141-1 should refer to PREFSENS in reference sensitivity level sub-clause of TS 38.104.  **Proposal 2:** For NB-IoT, PREFSENS in TS 38.141-1 should refer to PREFSENS in reference sensitivity level sub-clause of TS 36.104. |
| R4-2320659 | Ericsson | Discussion on clean-up and improvements on BS conformance testing specifications  **Proposal 1:** Perform the BS spec improvement activity under a specific sub-topic under existing topic [301] BS RF maintenance. |
| R4-2320660 | Ericsson | Proposal for checklist before submitting CR to BS conformance specifications  **Proposal:** Prioritize the discussions and agreement on the CR checklist during next meetings. |
| R4-2320661 | Ericsson | Work plan on clean-up and improvement the BS specifications |

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

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of change** |
|  |  | Xxx  **Summary of change:** Xxx. |
| R4-2318284 | CATT | CR for TS 38.176-2, Correction on scaling factor for IAB-MT type 1-O  **Summary of change:**   1. Add” Prated,x = Prated,c,TRP – 9 dB” for IAB-DU type 1-O in section 6.7.4.6.1. 2. Add *NRXU,active* Declaration identifier (D.64) for IAB-MT type 1-O. 3. Add *NTXU,active* Declaration identifier (D.65) for IAB-MT type 1-O. 4. Add that manufacturer shall declare *NTXU,active* for IAB-MT type 1-O in section 6.1. 5. Add that manufacturer shall declare *NRXU,active* for IAB-MT type 1-O in section 7.7.1. 6. Add modified factor “Y = 0 dB for IAB-DU and Y = - 9 + 10log10(NTXU,countedpercell) dB for IAB-MT.” for ACLR (CACLR) absolutelimit. 7. Add modified factor “Y = 0 dB for IAB-DU and Y = - 9 + 10log10(NTXU,countedpercell) dB for IAB-MT.” for OBUE requirement in section 6.7.4. 8. Add scaling factor “X = 9 dB for IAB-DU and X = 10log10(NTXU,countedpercell) dB for IAB-MT” for General OTA transmitter spurious emissions requirements in section 6.7.5.2. 9. Add modified factor “Y = 0 dB for IAB-DU and Y = - 9 + 10log10(NTXU,countedpercell) dB for IAB-MT.” for Additional spurious emissions requirements in section 6.7.5.4 and Co-location requirements in section 6.7.5.5. 10. Add scaling factor “X = 9 dB for IAB-DU and X = 10log10(NRXU,countedpercell) dB for IAB-MT” for OTA receiver spurious emissions in section 7.7.5.1. |
| R4-2318287 | CATT | CR for TS 38.115-2, Remove multi-band related content for repeater type 2-O  **Summary of change:** Remove multi-band operation related content. |
| R4-2318289 | CATT | CR for TS 38.141-1, Correction on reference of PREFSENS  **Summary of change:**   1. For PREFSENS for NB-IoT, change “tables 7.2-5, 7.2-6 and 7.2-8 of TS 36.141 [24]” to “tables 7.2.1-5, 7.2.1-5a and 7.2.1-5c of TS 36.104 [22]”. 2. For PREFSENS for band n46, change “tables 7.2.5-2a, 7.2.5-3a” to ”tables 7.2.2-2a and 7.2.2-3a of TS 38.104[2]”. 3. For PREFSENS for band n96, change “tables 7.2.5-2b, 7.2.5-3b” to “tables 7.2.2-2b and 7.2.2-3b of TS 38.104[2]”. 4. For PREFSENS for band n46 and n96, change “tables 7.2.5-2a, 7.2.5-2b,7.2.5-3a and 7.2.5-3b” to “tables 7.2.2-2a, 7.2.2-2b, 7.2.2-3a, 7.2.2-3b of TS 38.104[2]”. |
| R4-2318292 | CATT | CR for TS 38.141-2, Correction on title of Table 4.7.2.1-2 for test signal for BS type 2-O  **Summary of change:** Add title of Table 4.7.2.1-2 for signal to be used to build NR TCs for BS type 2-O. |
| R4-2318366 | Nokia, Nokia Shanghai Bell | [NR\_RF\_FR1-Core] CR to TS 38.104 on correction of transmitter spurious emissions for protection of Band n20  **Summary of change:** Correct band number in table for protection of Band n20. |
| R4-2318369 | Nokia, Nokia Shanghai Bell | [NR\_unlic-Perf] CR to TS 38.141-1 on correction of table numbers for Local Area BS in-channel selectivity for bands n46, n96 and n102  **Summary of change:** Correct table numbers for Local Area BS in-channel selectivity for bands n46, n96 and n102. |
| R4-2318372 | Nokia, Nokia Shanghai Bell | [NR\_n18-Core] CR to TS 36.104 on correction of transmitter spurious emissions for protection of Band n18  **Summary of change:** Add Band n18 to coexistence and co-location tables for transmitter spurious emissions. |
| R4-2318375 | Nokia, Nokia Shanghai Bell | [NR\_n18-Perf] CR to TS 36.141 on correction of transmitter spurious emissions for protection of Band n18  **Summary of change:** Add Band n18 to coexistence and co-location tables for transmitter spurious emissions. |
| R4-2318378 | Nokia, Nokia Shanghai Bell | [NR\_n18-Perf] CR to TS 37.145-1 on correction of transmitter spurious emissions for protection of Band n18  **Summary of change:** Add Band n18 to coexistence table for transmitter spurious emissions. |
| R4-2318381 | Nokia, Nokia Shanghai Bell | [NR\_n18-Perf] CR to TS 38.141-1 on correction of table reference for Band n18 transmitter spurious emissions  **Summary of change:** Correct table reference for Band n18 transmitter spurious emissions. |
| R4-2318384 | Nokia, Nokia Shanghai Bell | [NR\_n18-Perf] CR to TS 38.141-2 on correction of transmitter spurious emissions for protection of Band n18  **Summary of change:** Add Band n18 to coexistence table for transmitter spurious emissions. |
| R4-2319168 | Nokia, Nokia Shanghai Bell | Addition of 30 KHz SCS for Sync Raster for Band n53  **Summary of change:** 30 kHz SCS for Sync Raster for Band n53 is added. |
| R4-2319420 | Ericsson | CR to 37.141: Correction to method of test for GSM/EDGE requirements  **Summary of change:**  The following corrections are made:  - The Caption for Table 5.1-1a is corrected.  - In 7.4.4.5, CS15 is added and “blocking” is replaced by “”AM suppression”  - In 7.7.4.3, “blocking” is replaced by “intermodulation” |
| R4-2319421 | Ericsson | CR to 37.141: Correction to method of test for GSM/EDGE requirements  **Summary of change:**  The Caption for Table 5.1-1a is corrected.  In order to fix the incorrect CS references and also make the specification more future proof in case further CS are added, the explicit listing of CS is replaced by the stated references made in the applicability tables in Table 5.  The references can either be to test specifications (XX.141) or to specific test configurations TCx.  In this way, applicability of tests for each CS is kept only in Table 5 without duplication of information. To make all subclauses future proof, the change is made to all sections presently containing CS references:  - 7.2.4 for Reference sensitivity  - 7.3.4 for Dynamic range  - 7.4.4.4 for Additional narrowband blocking for GSM/EDGE  - 7.4.4.5 for GSM/EDGE AM suppression  - 7.7.4.3 for Additional narrowband intermodulation for GSM/EDGE  The editorial errors are corrected through the same changes. |
| R4-2319681 | Huawei, HiSilicon | [ MB\_MSR\_RF] CR to 37.104: clarification on requirements for BS capable of multi-band operation  **Summary of change:** A sentence is added in clause 4.8 to exclude the carrier (wanted signal) from the unwanted emission. |
| R4-2319684 | Huawei, HiSilicon | [ MB\_MSR\_RF] CR to 37.141: clarification on requirements for BS capable of multi-band operation  **Summary of change:** A sentence is added in clause 4.12 to exclude the carrier (wanted signal) from the unwanted emission. |
| R4-2319687 | Huawei, HiSilicon | [ MB\_MSR\_RF] CR to 38.104: clarification on requirements for BS capable of multi-band operation  **Summary of change:** A sentence is added in clause 4.8 to exclude the carrier (wanted signal) from the unwanted emission. |
| R4-2319690 | Huawei, HiSilicon | [ MB\_MSR\_RF] CR to 38.141-1: clarification on requirements for BS capable of multi-band operation  **Summary of change:** A sentence is added in clause 4.8 to exclude the carrier (wanted signal) from the unwanted emission. |
| R4-2319693 | Huawei, HiSilicon | [MSR\_GSM\_UTRA\_LTE\_NR-Perf] CR to 37.141: Power allocation for NC operation  **Summary of change:** Add the sentence to indicate that the same power per carrier is applicaple only when rated totral output power is met at first step with choosed channel bandwidth. |
| R4-2319696 | Huawei, HiSilicon | [MSR\_GSM\_UTRA\_LTE\_NR-Perf] CR to 37.145-1: Power allocation for NC operation  **Summary of change:** Add the sentence to indicate that the same power per carrier is applicaple only when rated totral output power is met at first step with choosed channel bandwidth. |
| R4-2319699 | Huawei, HiSilicon | [MSR\_GSM\_UTRA\_LTE\_NR-Perf] CR to 37.145-1: Power allocation for NC operation  **Summary of change:**  1. Add the sentence to indicate that the same power per carrier is applicaple only when rated totral output power is met at first step with choosed channel bandwidth.  2.The similar change is added as 37.145-1 for ANTCR9 |
| R4-2319801 | Ericsson | CR to 37.104: Correction to table note for band 66  **Summary of change:** For band 66, Note 7 is changed to note 3 in Table 4.5-1 |
| R4-2319804 | Ericsson | CR to 37.141: Correction to table note for band 66  **Summary of change:** For band 66, Note 7 is changed to note 3 in Table 4.4-1 |
| R4-2320353 | ZTE | NR\_IAB-Core: CR to 38.174 Correction of the value of X in IAB-MT OTA receiver spurious emissions  **Summary of change:** Change X=10log10 (NRXU, countedpercell) dB to X=9 dB |
| R4-2320497 | Nokia, Nokia Shanghai Bell | [LTE\_LAA-Perf] CR to TS 36.141 on correction of transmitter OFF power for Band 46  **Summary of change:** Add carrier frequency 4.2GHz < f ≤ 6.0GHz in the transmitter OFF power. |
| R4-2320538 | Ericsson | CR to align scaling factor for IAB-MT type I-O to IAB-DU type 1-O  **Summary of change:** Modify the scaling factor for unwanted emission of IAB-MT type 1-O to be the same with IAB-DU type 1-O. |

## Open issues summary

N/A

# Topic #2: BS RF requirements and BS conformance testing (Rel-17) (5.2.2)

## Companies’ contributions summary

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

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of change** |
| R4-2318293 | CATT | CR for TS 38.108, Correction on out-of-band emissions  **Summary of change:**   1. Add an explanation for necessary bandwidth in sub-clause 6.6.4.1. 2. Add symobls Prated,t,TABC , Prated,t,sys in sub-clause 3.2. 3. Remove PSDchannel and BWSAN in sub-clause 6.6.4.1. 4. Update basic limit with , and Remove PSD equation. |
| R4-2318295 | CATT | CR for TS 38.181, Correction on out-of-band emissions  **Summary of change:**   1. Add an explanation for necessary bandwidth in sub-clause 6.6.4.1. 2. Add symbols Prated,t,TABC , Prated,t,sys in sub-clause 3.2. 3. Remove PSDchannel and BWSAN in sub-clause 6.6.4.1. 4. Update basic limit with , and Remove PSD equation. 5. Remove ΔfOBUE related content for spurious emission requirement. 6. Change “FDL\_low - ΔfOBUE” to “BWSAN lower edge frequency - 2×BWSAN”. 7. Change “FDL\_high + ΔfOBUE” to “BWSAN upper edge frequency + 2×BWSAN”. |
| R4-2318306 | CATT | CR for TR 38.863, Correction on Satellite and UE Antenna and beam forming pattern modelling  **Summary of change:** Modify the parameter for radius of the antenna's circular aperture from x to a. |
| R4-2319308 | Ericsson | [NR\_cov\_enh-Perf] CR for configuration of FR1 PUSCH TBoMS demodulation requirement  **Summary of change:** Change the available number of TBoMS slots for FDD from 8 to 4. |
| R4-2320159 | NEC | CR to 38.141-2: Measurement uncertainty for OBW in FR2-2 (Rel-17)  **Summary of change:**  Keep 600 kHz MU for BW of 400 MHz or smaller. Specify 2400 kHz MU for BW of 800 MHz or larger. |
| R4-2320162 | NEC | CR to 38.106: Correction of terminologies for NR repeaters (Rel-17)  **Summary of change:**  Replace “transmitter OFF/ON state” with “transmitter OFF/ON period”. Define “transmitter transient period”. |
| R4-2320164 | NEC | CR to 38.115-1: Correction of terminologies for NR repeaters (Rel-17)  **Summary of change:**  Replace “transmitter OFF/ON state” with “transmitter OFF/ON period”. Define “transmitter transient period”. |
| R4-2320166 | NEC | CR to 38.115-2: Correction of terminologies for NR repeaters  **Summary of change:**  Replace “transmitter OFF/ON state” with “transmitter OFF/ON period”. Define “transmitter transient period”. |
| R4-2320263 | Nokia, Nokia Shanghai Bell | CR to TS 38.106 with correction of co-existence and co-location requirements  **Summary of change:**   * Addition of missing band n85 for co-existence requirement in Table 6.5.4.2.2-1 * Correction of NR Band 85 to n85 in co-location requirement in Table 6.5.4.2.3-1 |
| R4-2320264 | Nokia, Nokia Shanghai Bell | CR to TS 38.106 with correction of co-existence and co-location requirements  **Summary of change:**  - Addition of missing band n85 for co-existence requirement in Table 6.5.4.2.2-1  - Addition of missing E-UTRA Band 106 for co-existence requirement in Table 6.5.4.2.2-1  - Correction of NR Band 85 to n85 in co-location requirement in Table 6.5.4.2.3-1  - Addition of missing E-UTRA Band 106 for co-location requirement in Table 6.5.4.2.3-1 |
| R4-2320265 | Nokia, Nokia Shanghai Bell | CR to TS 38.114 with update to manufacturer declaration and references  **Summary of change:**  Correction of deflaration D3 to D2 in clause 4.1.  Updates of references in clauses 4.1 and 4.2. |
| R4-2320266 | Nokia, Nokia Shanghai Bell | CR to TS 38.115-1 with correction of co-existence and co-location requirements  **Summary of change:**   * Addition of missing band n85 for co-existence requirement in Table 6.5.4.2.2-1 * Correction of NR Band 85 to n85 in co-location requirement in Table 6.5.4.2.3-1 |
| R4-2320267 | Nokia, Nokia Shanghai Bell | CR to TS 38.115-1 with correction of co-existence and co-location requirements  **Summary of change:**  - Addition of missing band n85 for co-existence requirement in Table 6.5.4.5.2-1  - Addition of missing E-UTRA Band 106 for co-existence requirement in Table 6.5.4.5.2-1  - Correction of NR Band 85 to n85 in co-location requirement in Table 6.5.4.5.3-1  - Addition of missing E-UTRA Band 106 for co-location requirement in Table 6.5.4.5.3-1 |
| R4-2320268 | Nokia, Nokia Shanghai Bell | CR to TS 38.174 with correction of co-existence and co-location requirements  **Summary of change:**  - Addition of missing E-UTRA Band 106 for co-existence requirement in Table 6.6.5.2.2-1  - Correction of NR Band 85 to n85 in co-location requirement in Table 6.6.5.2.3-1  - Addition of missing E-UTRA Band 106 for co-location requirement in Table 6.6.5.2.3-1 |
| R4-2320269 | Nokia, Nokia Shanghai Bell | CR to TS 38.174 with correction of co-location requirements  **Summary of change:**  - Correction of NR Band 85 to n85 in co-location requirement in Table 6.6.5.2.3-1 |
| R4-2320270 | Nokia, Nokia Shanghai Bell | CR to TS 38.176-1 with correction of co-existence and co-location requirements  **Summary of change:**  - Correction of NR Band n105 in co-existence requirement in Table 6.6.5.5.2-1  Addition of missing E-UTRA Band 106 for co-existence requirement in Table 6.6.5.5.2-1  - Addition of missing band NR Band n105 and E-UTRA Band 106 for co-location requirement in Table 6.6.5.5.3-1 |
| R4-2320271 | Nokia, Nokia Shanghai Bell | CR to TS 38.176-1 with correction of co-location requirements  **Summary of change:**  - Correction of NR Band 85 to NR Band n85 in co-location requirement in Table 6.6.5.5.3-1 |
| R4-2320272 | Nokia, Nokia Shanghai Bell | CR to TS 38.176-2 with correction of co-existence and co-location requirements  **Summary of change:**  - Correction of band n91, n92, n94, n95, n105 in co-existence requirement in Table 6.7.5.4.5.1-1  - Addition of missing E-UTRA Band 106 for co-existence requirement in Table 6.7.5.4.5.1-1  - Addition of missing band E-UTRA Band 106 for co-location requirement in Table 6.7.5.5.5.1-1 |
| R4-2320273 | Nokia, Nokia Shanghai Bell | CR to TS 38.176-2 with correction of co-existence requirements  **Summary of change:**   * Correction of band n85, n86, n89, n91, n92, n93 in co-existence requirement in Table 6.7.5.4.5.1-1 |
| R4-2320532 | Ericsson | CR to update FR2 range in IAB specification  **Summary of change:** Align the FR2 range definition with 38.104, adding FR2-1 limitation in IAB specification |
| R4-2320534 | Ericsson | CR to update FR2 range in IAB specification  **Summary of change:** Align the FR2 range definition with 38.104, adding FR2-1 limitation in IAB specification |
| R4-2320536 | Ericsson | CR to update FR2 range in IAB specification  **Summary of change:** Align the FR2 range definition with 38.104, adding FR2-1 limitation in IAB specification |
| R4-2320705 | Union Inter. Chemins de Fer | Correction to TR 38.852  **Summary of change:** In case of implementation of a coordination procedure or other mitigation measures it is possible to deploy higher e.i.r.p. for RMR BS than stated in the technical conditions in ECC Decision (20)02 Annex 2 and 3 |
| R4-2320706 | Union Inter. Chemins de Fer | Correction to TR 38.853  **Summary of change:** In case of implementation of a coordination procedure or other mitigation measures it is possible to deploy higher e.i.r.p. for RMR BS than stated in the technical conditions in ECC Decision (20)02 Annex 2 and 3 |
| R4-2320710 | Union Inter. Chemins de Fer | Removal of RMR Wide Area BS type 1-C rated output power limits  **Summary of change:** Removal of RMR BS conducted output power limits in bands n100 and n101 |
| R4-2320712 | Union Inter. Chemins de Fer | Removal of RMR Wide Area BS type 1-C rated output power limits  **Summary of change:** Removal of RMR BS conducted output power limits in bands n100 and n101 |

## Open issues summary

N/A

# Topic #3: BS RF requirements (Rel-18) (6.2.2)

*No Tdocs.*