**3GPP TSG-RAN WG4 Meeting #98-e *R4-21xxxxx***

Draft

**Electronic Meeting, 25 January – 5 February, 2020**

**Agenda item:** 4.4, 5.1, 7.19.4

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [98e Bis][301] BS RF Maintenance

**Document for:** Information

# Introduction

The e-mail discussion covers Rel-15 and Rel-16 BS RF Core maintenance for NR, LTE and MS BS, i.e. Agenda items 4.4, 5.1 and 7.19.4.

The BS RF core spec TS 38.104 is very stable in Rel-15 and Rel-16 and there are few contributions in this area. Contributions were submitted within the following Topics:

1. Japanese regulation for 2.5GHz (BWA)
2. AAS capability set and support for NR+UTRA
3. Other maintenance

All topics include CRs for corrections.

# Topic #1: Japanese regulation for 2.5GHz (BWA)

The background for the Japanese regulation is given in an information paper in R4-2101016, accompanied with a set of CRs for NR and LTE specs (core + conformance) in R4-2101082 to R4-2101090.

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2101016 | SoftBank Corp., KDDI Corporation, NEC Corporation | **Support of Japan regulation for 2.5GHz(BWA) in NR BS**  Information and background. |

(Cat A CRs are not listed)

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2101082 | NEC, SoftBank, KDDI | **CR to TS 36.104: Additions of regional requirements for band 41 in Japan, Rel-15**  Summary of change:  Updated list of regional requirements. Modified additional requirement for BS output power. Updated spurious emissions requirement. Added text for ACLR, OBUE, tx spurious, rx spurious requirements to indicate regional regulation may specify them differently. |
| R4-2101085 | NEC, SoftBank, KDDI | **CR to TS 36.141: Additions of regional requirements for band 41 in Japan, Rel-15**  Summary of change:  Updated list of regional requirements. Modified additional requirement for BS output power. Updated spurious emissions requirement. Added text for ACLR, OBUE, tx spurious, rx spurious requirements to indicate regional regulation may specify them differently. |
| R4-2101088 | NEC, SoftBank, KDDI | **CR to TS 38.104: Additions of regional requirements for n41 in Japan, Rel-15**  Summary of change:  Updated list of regional requirements. Added additional requirement for BS output power. Added additional spurious emissions requirement. Added text for ACLR, OBUE, tx spurious, rx spurious requirements to indicate regional regulation may specify them differently for BS type 1-C. |
| R4-2101089 | NEC, SoftBank, KDDI | **CR to TS 38.104: Additions of regional requirements for n41 and n90 in Japan, Rel-16**  Summary of change:  Updated list of regional requirements. Added additional requirement for BS output power. Added additional spurious emissions requirement. Added text for ACLR, OBUE, tx spurious, rx spurious requirements to indicate regional regulation may specify them differently for BS type 1-C. |
| R4-2101091 | NEC, SoftBank, KDDI | **CR to TS 38.141-1: Additions of regional requirements for n41 in Japan, Rel-15**  Summary of change:  Updated list of regional requirements. Added additional requirement for BS output power. Added additional spurious emissions requirement. Added text for ACLR, OBUE, tx spurious, rx spurious requirements to indicate regional regulation may specify them differently for BS type 1-C. |
| R4-2101092 | NEC, SoftBank, KDDI | **CR to TS 38.141-1: Additions of regional requirements for n41 and n90 in Japan, Rel-16**  Summary of change:  Updated list of regional requirements. Added additional requirement for BS output power. Added additional spurious emissions requirement. Added text for ACLR, OBUE, tx spurious, rx spurious requirements to indicate regional regulation may specify them differently for BS type 1-C. |
| R4-2101094 | NEC, SoftBank, KDDI | **CR to TS 38.141-2: Additions of regional requirements for n41 in Japan, Rel-15**  Summary of change:  Updated list of regional requirements. Added additional requirement for BS output power. Added additional spurious emissions requirement. |
| R4-2101095 | NEC, SoftBank, KDDI | **CR to TS 38.141-2: Additions of regional requirements for n41 and n90 in Japan, Rel-16**  Summary of change:  Updated list of regional requirements. Added additional requirement for BS output power. Added additional spurious emissions requirement. |

## Companies views’ collection for 1st round

### Open issues

Please submit any questions or comments on the information provided about Japanese regulation for 2.5 GHz (BWA).

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| **Company** | **Comments** |
| XXX |  |

### CRs/TPs comments collection

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

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

*Recommendations on WF/LS assignment*

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|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

|  |  |
| --- | --- |
| **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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: AAS capability set and support for NR+UTRA (CRs)

This is a continuing topic from RAN4 #96-e and 97-e. For this meeting, there are two sets of CRs available.

## Companies’ contributions summary

(Cat A CRs are not listed)

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2102563 | Huawei, China Unicom | **CR to TS 37.105: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**  Summary of change:  - 4.1: clarification on the supported RATs - 6.6.5.2.2, 6.6.5.2.3: updates to the OBUE applicability table and related OBUE tables headers corrections - 7.4.2.1: conducted general blocking table updated  - 7.7.2.1: conducted Tx IMD table updated - 10.5.2.1: OTA general blocking table updated - 10.8.2.1: OTA Tx IMD table updated |
| R4-2102565 | Huawei, China Unicom | **CR to TS 37.145-1: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**  Summary of change:  - 4.9: introduction of CSA3B for UTRA, EUTRA, NR multi-RAT case. - 4.11.2.8.1.2 (ATC5a): applicabiltiy table updated with new CS - 4.11.2.8.2 (ATC5b): MSR changes reflected. Applicabiltiy table updated with new CS - 4.11.2.9, 4.11.2.10 (ATC6, ANTC6): MSR changes reflected. Power allocation section updated.  - 4.11.2.13, 4.11.2.14 (ATC8, ANTC8): new section for UTRA, E-UTRA and NR multi-RAT operation - 5.2: Test configuration applicability table updated with nes CSA3B test case  - 6.6.5.5.2, 6.6.5.5.3: updates to the OBUE applicability table and related OBUE tables headers corrections  - 7.4.5.1.1: general blocking table updated  - 7.7.5.1.1: Tx IMD table updated |
| R4-2102567 | Huawei, China Unicom | **CR to TS 37.145-2: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**  Summary of change: - 4.9: introduction of RCSA3B for UTRA, EUTRA, NR multi-RAT case. - 4.11.2.8.1.2 (ATCR5): applicability table updated with new CS - 4.11.2.8.2 (ATCR5b): MSR changes reflected. Applicabiltiy table updated with new CS - 4.11.2.9, 4.11.2.10 (ATCR7, ANTCR7): MSR changes reflected. Power allocation section updated.  - 4.11.2.13, 4.11.2.14 (ATCR9, ANTCR9): new section for UTRA, E-UTRA and NR multi-RAT operation - 5.2: Test configuration applicability table updated with nes RCSA3B test case  - 6.6.5.5.2, 6.6.5.5.3: conducted OBUE applicability table introduced for Band Category 1, 2, 3; table headers updated - 7.8.5.1.1: Tx IMD table updated |
| R4-2102844 | Ericsson | **CR to 37.105 on NR+UTRA support for AAS**  Summary of change:  It is added explicitly to the General section that for AAS BS, GSM/EDGE operation is not supported and that UTRA operation is only supported as single-RAT or in combination with E-UTRA. |

## Open issues summary

### Sub-topic 2-1

In the work item MSR\_GSM\_UTRA\_LTE\_NR, the MSR BS specification was extended with additional Capability Sets and requirements for NR + UTRA/GSM combinations. These were not reflected in the AAS specifications, which were not part of the work item.

The CRs submitted provides two different solutions for the AAS specifications.

**Issue 2-1: Options for Capability sets including UTRA in AAS specs**

* Proposals
  + **Option 1: (CR in R4-2102844)**Add an explicit statement in the AAS core spec that UTRA operation is only supported as single-RAT or in combination with E-UTRA.
  + **Option 2: (CRs in R4-2102563, R4-2102565, R4-2102567)**Update relevant AAS core and test requirements to cover combined NR & UTRA support, and add a new Capability Set for AAS with NR, E-UTRA and UTRA, plus two new Test Configurations.

Note that the options given above are the same as at RAN4 #97-e.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1:  ….  Others: |

### CRs/TPs comments collection

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

*Suggestion on WF/LS assignment*

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| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #3: Other maintenance (CRs)

Five diverse topics are covered by CRs under “Other maintenance”:

* Correction of antenna model in TR 38.820.
* EESS protection requirement correction.
* Correction to ACLR limit in non-contiguous spectrum (CR implementation correction).
* Removal of additional limit for Band 7
* OBUE table headings and applicability in MSRT and AAS specs  
  (NOTE: The CRs for TS 37.105 and TS 37.145-1/2 may partly overlap with CRs for Topic #2: AAS capability set and support for NR+UTRA.)

## Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2101180 | Ericsson | **CR to TR 38.820: Correction of antenna model in subclause 7.2.4**  Summary of change: The parameter definition is aligned with array factor equations given in the array antenna model, captured in Table 7.2.4-2. Currently, the definition of rows and columns are mixed and does not map towards the array factor definition, originally defined in TR 37.840. |
| R4-2101994 | Nokia, Nokia Shanghai Bell | **CR to TS 38.104: EESS protection requirement correction**  Summary of change: The statement that protection limit enters into force in 1 January 2021 is removed. |
| R4-2101997 | Nokia, Nokia Shanghai Bell | **CR to TS 38.141-2: EESS protection requirement correction**  Summary of change: The statement that protection limit enters into force in 1 January 2021 is removed. |
| R4-2102441 | Nokia, Nokia Shanghai Bell | **CR to 37.141: Correction to ACLR limit in non-contiguous spectrum (Rel-15)**  Summary of change: “NR” is removed in NOTE 3 to address E-UTRA carrier transmitted at the other edge of the gap. “NR” is added back in NOTE 4 as in agreed CR in R4-2016186 and R4-2016187. |
| R4-2102841 | Ericsson | **CR to 37.145-1 on Removal of additional limit for Band 7**  Summary of change: The additional limit for Band 7 is removed. |
| R4-2102847 | Ericsson | **CR to 37.104 on OBUE table headings and applicability**  Summary of change: The CR corrects the headings to align with the intended applicability. The revised headings are all written with the same structure: “<BS class> BS operating band unwanted emission mask (UEM) in <BC> bands <f. range> applicable for: <BS type 1>; <BS type 2>; …” Where  <BS class> = “Wide Area”, “Medium range” or “Local Area”  <BC> = BC1, BC2, BC3 or combination thereof  <f range> = Limitation to frequency range for bands, e.g. “below 1 GHz”  <BS type> = A set of conditions on supported RAT(s), specific bands, etc., always starting with “BS…”, separated by “,” and an “and” for the final condition. Condition on max power is always first.  If there are multiple types, they are separated by “;” |
| R4-2102850 | Ericsson | **CR to 37.141 on OBUE table headings and applicability**  Summary of change: Same as for TS 37.104. |
| R4-2102853 | Ericsson | **CR to 37.105 on OBUE table headings and applicability**  Summary of change: Same as for TS 37.104. |
| R4-2102856 | Ericsson | **CR to 37.145-1 on OBUE table headings and applicability**  Summary of change: Same as for TS 37.104. |
| R4-2102859 | Ericsson | **CR to 37.145-2 on OBUE table headings and applicability**  Summary of change: Same as for TS 37.104. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
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## Summary for 1st round

### Open issues

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

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |