**3GPP TSG-RAN WG4 Meeting #112-bis R4-24xxxxx**

**Hefei, China, 14 – 18 October, 2024**

**Third Generation Partnership Project (3GPP™)**

**DRAFT Meeting Report  
for  
TSG RAN WG4  
meeting: 112**

**Maastricht, Netherlands, 19/08/2024 to 23/08/2024**

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## 1 Opening of the meeting

The Chair Xizeng Dai (Huawei) opened the meeting at RAN4#112 on 19/08/2024 at 09:00.

Dominique Everaere (Ericsson) provided the welcome speech.

**Intellectual Property Rights Declaration Policy**

The attention of the delegates to the meeting of this Technical Specification Group was drawn to the fact that 3GPP Individual Members have the obligation under the IPR Policies of their respective Organizational Partners to inform their respective Organizational Partners of Essential IPRs they become aware of.

The delegates were asked to take note that they were thereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.

- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Information Statement and the Licensing declaration forms.

**Statement regarding competition law**

The attention of the delegates to the meeting was drawn to the fact that 3GPP activities were subject to all applicable antitrust and competition laws and that compliance with said laws was therefore required by any participant of the meeting, including the Chair and Vice-Chairs and were invited to seek any clarification needed with their legal counsel. The leadership would conduct the present meeting with impartiality and in the interests of 3GPP. Delegates were reminded that timely submission of work items in advance of TSG/WG meetings was important to allow for full and fair consideration of such matters.

**Meeting arrangements**

The meeting was conducted in three parallel sessions; Main session, RRM session, and BS RF Test Demod session. The Main session was chaired by RAN4 Chair Xizeng Dai (Huawei), RRM session was chaired by RAN4 Vice Chair Shan Yang (China Telecom), and BS RF Test Demod session was chaired by RAN4 Vice Chair Gene Fong (Qualcomm). The sessions were further broken down into separate GTW sessions (separate meeting rooms in F2F meeting). Webinar sessions were made available for online particpants.

Note: One or two additional offline(s) / adhoc session(s) may be scheduled according to RAN conclusion. Total three parallel GTW sessions would be scheduled. Plus, any additonal Offline(s) / ad hoc sesion(s) = ad hoc room or breakout room in F2F meeting.

**Check-in for Registered Delegates**

The attention of the delegates to this meeting was drawn to the fact that it is not permitted to check in other delegates on their behalf. In the even of technical difficulties preventing check in, delegates are encouraged to contact in person MCC.

**Ordinary E-meeting participation**

Attendance at ordinary e-meetings now counts towards accrual and maintenance of voting rights.

- A delegate is deemed to have attended a given meeting if they confirm their participation by check in. If a delegate does not check in during the meeting, it shall be assumed that the individual did not attend.

**Face-to-Face meeting with one-way remote participation (going forward there is no longer two-way remote)**

When it is a face-to-face (ordinary) meeting with one-way remote participation.

- In a meeting designated as face to face (ordinary), those participating remotely are not to be counted toward quorum or attendance, and are not allowed to vote

**F2F network usage conditions**

The PCG has laid down the following network usage conditions as provided below:

**Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws**.

**Users shall not engage in non-work related activities that consume excessive bandwidth** or cause significant degradation of the performance of the network.

Since the **network is a shared resource**, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting Chair should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

**1. DON’T place your WiFi device in ad-hoc mode**

**2. DON’T set up a personal hotspot in the meeting room**

**3. DO try 802.11a if your WiFi device supports it**

**4. DON’T manually allocate an IP address**

**5. DON’T be a bandwidth hog by streaming video, playing online games, or downloading huge files**

**6. DON’T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)**

**Recording of RAN4 Meeting**

Recording of the GoToWebinar sessions of the present meeting is strictly prohibited. No individual or entity – including the speakers and/or the authors – may electronically record any portion of the meeting without prior written consent of the Chair and all the RAN4 meeting participants.

**Snapshot of contributions type areas submitted in 3GU before the start of the meeting: Total: 2466**

**Figure 1: Breakdown of contributions type areas for RAN4#112 pre-meeting**

At the beginning of the meeting, there are 805 CRs (60 was either withdrawn/revised) that have been submitted to the meeting.

1. There are 545 CRs that are marked as available in 3GU

2. There are 40 CRs with parsing failure issues (note: the list of tdocs have already been submitted on RAN4 reflector)

R4-2411050

R4-2411051

R4-2411345

R4-2411346

R4-2411351

R4-2411363

R4-2411364

R4-2411366

R4-2411369

R4-2411371

R4-2411373

R4-2411375

R4-2411377

R4-2411378

R4-2411611

R4-2411612

R4-2412002

R4-2412155

R4-2412162

R4-2412178

R4-2412285

R4-2412287

R4-2412288

R4-2412445

R4-2412513

R4-2412516

R4-2412870

R4-2412874

R4-2412875

R4-2412876

R4-2413083

R4-2413084

R4-2413085

R4-2413086

R4-2413087

R4-2413088

R4-2413089

R4-2413090

R4-2413091

R4-2413092

3. There are 195 CAT A CRs reserved in 3GU (note: if any CAT A CRs are missing, please notify chair or session chairs)

4. There are 60 CRs that are marked as withdrawn in 3GU

5. There are 5 CAT F CRs not made available by Huawei, HiSilicon. The tdoc numbers are:

a. R4-2312782

b. R4-2412781

c. R4-2412779

d. R4-2412778

e. R4-2412777

Breakdown of available CRs at start of the meeting:

- Rel-13 CR (1)

- MCC: This is for a (NB\_IOT-Perf) CR on RSRP-ThresholdsNPRACH-InfoList for NB-IoT (Cat-F Rel-13)

- Rel-14 CR (3)

- Rel-15 CRs (28)

- Rel-16 CRs (56)

- Rel-17 CRs (162)

- Rel-18 CRs (495)

- Rel-19 CR (14)

- MCC: There should not be any Rel-19 CRs for agreement at this stage. They were all withdrawn.

## 2 Meeting agenda, arrangement and meeting report

## 3 Incoming LS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Release** | **WI** | **Source** | **Action** | **Decision** |
| R4-2411003 | Reply LS on SL positioning measurement | Rel-18 | NR\_pos\_enh2-Core | RAN1 | RAN1 confirms requesting and/or reporting only SL PRS-RSRP or SL PRS-RSRPP without any other SL positioning measurements is not supported.  RAN1 would like to inform RAN4 and RAN2 of the following with regards to the mapping between the mandatory measurement and the targeted SL positioning method,  - SL-RSTD is mandatory for SL-TDOA  - SL RTOA is mandatory for SL-TOA  - SL UE Rx - Tx time difference is mandatory for SL-RTT  - at least one of SL AoA/ZoA should be reported for SL-AoA  **ACTION:**  RAN1 respectfully requests RAN WG4 and WG2 to take account the above information. |  |
| R4-2411004 | LS on Rel-18 RAN1 UE features list for NR after RAN1#117 | Rel-18 | NR\_MIMO\_evo\_DL\_UL, NR\_pos\_enh2, Netw\_Energy\_NR, NR\_netcon\_repeater, NR\_NTN\_enh, NR\_Mob\_enh2, NR\_SL\_enh2, NR\_redcap\_enh, NR\_MC\_enh, NR\_XR\_Enh, NR\_FR1\_lessthan\_5MHz\_BW, NR\_DSS\_enh, NR\_BWP\_wor, NR\_cov\_enh2, TEI18 | RAN1 |  |  |
| R4-2411005 | LS on Rel-18 RAN1 UE features list for LTE after RAN1#117 | Rel-18 | IoT\_NTN\_enh | RAN1 |  |  |
| R4-2411006 | Reply LS on Reference Point for SSB-TimeOffset | Rel-18 | NR\_NTN\_enh-Core | RAN1 |  |  |
| R4-2411007 | LS on UE assistance information | Rel-19 | NR\_XR\_Ph3-Core | RAN1 | Particularly, it was discussed whether impact on RRM performance from skipping measurement occasions may be reduced if UE sends additional information:  - Information about the maximum number of MGs/SMTC with restrictions that can be skipped within a time period.  - Information about the patterns of gap(s)/restriction(s) where skipping is feasible or acceptable.  **ACTION:**  RAN1 kindly asks RAN4 to consider the above information into account and decide whether or not to introduce any UE assistance information related to measurement occasions. |  |
| R4-2411008 | LS on RACH during uplink transmission extension | Rel-18 | IoT\_NTN\_Enh-Core | RAN2 | Based on the above agreements, RAN2 kindly asks RAN4 and RAN1:  Q1: Whether an RRC Idle UE with a pre-compensated TA (i.e., the one used for Msg1 transmission during random access for IoT NTN) can satisfy the required timing accuracy for Msg3 transmission without Msg1/Msg2?  Q2: If the answer for Q1 is no, from RAN4 and RAN1 perspective, how the required timing accuracy for Msg3 transmission can be satisfied in this case?  **ACTION:**  RAN2 respectfully requests RAN4 and RAN1 to take RAN2 progress into account and provide feedback. |  |
| R4-2411009 | LS on UL synchronization for contention based Msg3 transmission without Msg1/Msg2 | Rel-19 | IoT\_NTN\_Ph3-Core | RAN2 |  |  |
| R4-2411010 | Reply LS on SL positioning measurements | Rel-18 | NR\_pos\_enh2 | RAN2 | RAN4 respectfully asks RAN2 to clarify:  - whether SL PRS-RSRP or SL PRS-RSRPP can be requested and/or reported standalone specifically for SL-AoA positioning.  RAN2 agreed that SL PRS-RSRP or SL PRS-RSRPP cannot be requested and/or reported standalone for SL-AoA positioning.  **ACTION:**  RAN2 respectfully asks RAN4 to take the above RAN2 agreement and response into account. |  |
| R4-2411011 | LS reply on 3Tx SAR solution for inter-band CA with PC1.5 | Rel-18 | 4Rx\_low\_NR\_band\_handheld\_3Tx\_NR\_CA\_ENDC-Core | RAN2 | RAN2 would like to thank RAN4 on the LS R4-2406579.  For the Q1 in the RAN4 LS, RAN2 confirms that there is no technical problem of reusing the capability of maxUplinkDutyCycle-interBandCA-PC2 to the SAR solution in PC1.5. Since there is no legacy network supporting the 3Tx inter-band UL CA with PC1.5 today, there would be no NBC issue.  RAN2 also agreed to update the capability of maxUplinkDutyCycle-interBandCA-PC2 to accommodate the SAR solution for 3Tx inter-band UL CA in power class 1.5 based on RAN4 requirement. The agreed TS 38.306 CRs are in the attachment.  **ACTION:**  RAN2 respectfully asks RAN4 to take the above feedback information into account. |  |
| R4-2411012 | Reply LS on IE supportedBandwidthCombinationSetIntraENDC and IE intraBandENDC-Support | Rel-17 | TEI17 | RAN2 | RAN2 has discussed and agreed to introduce new capabilities to support an inter-band (NG)EN-DC band combination with multiple intra-band (NG)EN-DC components.  The RAN2 agreed CRs are also attached for information. With the agreed CRs, the UE can indicate BCSs and spectrum contiguity capabilities for the maximum four intra-band (NG)EN-DC components in an inter-band (NG)EN-DC band combination.  **ACTION:**  RAN2 kindly asks RAN4 to confirm whether the above fulfils the RAN4 requirement for supporting multiple intra-band (NG)EN-DC components within an inter-band (NG)EN-DC band combination. |  |
| R4-2411013 | Reply LS on Rel-18 higher-layers parameter list | Rel-18 | NR\_MC\_enh-Core, NR\_MIMO\_evo\_DL\_UL-Core, NR\_pos\_enh2-Core, Netw\_Energy\_NR, NR\_cov\_enh2, NR\_XR\_enh-Core, NR\_Mob\_enh2, NR\_BWP\_wor-Core, NR\_NTN\_enh, IoT\_NTN\_enh-Core, NR\_SL\_enh2-Core, NR\_netcon\_repeater, NR\_DSS\_enh, NR\_redcap\_enh-Core, TEI18 | RAN2 |  |  |
| R4-2411014 | Reply LS on RAN4 vs RAN2 Cricket Match | Rel-19 | TEI19 | RAN2 | RAN2 would like to thank RAN4 for challenging RAN2 for a friendly game of cricket during the Maastricht WG meetings and for making the necessary arrangements with the Maastricht Cricket Club for the match.  RAN2 would like to confirm that the challenge is accepted and RAN2 will put together a team for the match!  RAN2 would kindly remind RAN4 to use the summer for practicing their cricketing skills as RAN4 will definitely need all of this during the match. May the best team (i.e. RAN2) win! Bring it on!  **ACITON:**  RAN2 kindly requests RAN4 to take the above information into account and to practice during the summer so that we can have a good contest. |  |
| R4-2411015 | LS on Development of NB-IoT test cases for Release 15 and Release 16 | Rel-15 | NB\_IOT | RAN5 |  |  |
| R4-2411016 | LS on Avoiding Cross-TSG TEI |  |  | RAN |  |  |
| R4-2411017 | Blocking requirements for extended L band |  |  | ETSI TC SES | TC-SES would like to acknowledge that the blocking requirements are being revised - based on the latest version of the ECC Report 263 “Adjacent band compatibility studies between IMT operating in the frequency band 1492-1518 MHz and the MSS operating in the frequency band 1518-1525 MHz” - in ETSI EN 301 681 Harmonised Standard for Mobile Earth Stations (MES) of Geostationary mobile satellite systems, including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) under the Mobile Satellite Service (MSS), operating in the 1,5 GHz and 1,6 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU”  It should be noted that ETSI EN 301 681 covers “Land Mobile Earth Stations (LMESs), Maritime Mobile Earth Stations (MMESs) and Satellite Personal Communications Networks (S PCN) MESs radio equipment with an EIRP of less than or equal to 15 dBW” where S-PCN MESs may be handheld equipment. Such equipment is typically for professional and governmental use with possible safety of life or critical mission requirements.  TC-SES are currently discussing the development of a new harmonised standard for NTN capable UE operating with “IoT-NTN” systems in MSS allocated frequency bands below 7.125 GHz. This will require coordination with ECC.  **ACTION:**  None |  |
| R4-2413465 | LS on Head Phantom for XR devices OTA testing | Rel-19 | TRP\_TRS\_MIMO\_OTA\_Ph3-Core | OTA NFP | The Near Field Phantom Sub-Working Group has now endorsed the following proposal for the development of the XR phantom.  - Seamless gel filled head shell, compatible with current CTIA Certification head definitions 0.3-6GHZ  - Anatomical ears, exchangeable ears on shell 1x set 0.3-3GHz and 1x set for 3110GHz (geometry of ears in compliance with ITU-T P57 04/2009)  The sub-working group will work on the interface between the head shell and the anatomical ears. After that interface is defined, a prototype can be made which should take approximately 3-4 months. After the prototype is available, the group will then focus on the development of positioning guidelines and relevant MU.  **ACTION:**  None |  |

3A Topic Summary (pre-meeting)

This agenda item is only for at-meeting-generated content related to topic summary.

3A.1 Main session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Type** | **For** | **Abstract** | **AI** | **Doc Status** | **Decision** |
| R4-2412803 | Topic summary for [112][101] Upto\_R17\_UERF\_maintenance | Moderator(OPPO) | other | Information | [112][100] Main Session | 4.1 |  |  |
| R4-2412804 | Topic summary for [112][102] R18\_UERF\_maintenance\_Part1 | Moderator(Meta) | other | Information | [112][100] Main Session | 5.1 |  |  |
| R4-2412805 | Topic summary for [112][103] R18\_UERF\_maintenance\_Part2 | Moderator(Huawei) | other | Information | [112][100] Main Session | 5.1 |  |  |
| R4-2412806 | Topic summary for [112][104] NR\_LTE\_Rel-18\_feature\_list | Moderator(CMCC) | other | Information | [112][100] Main Session | 5.1 |  |  |
| R4-2412807 | Topic summary for [112][105] NR\_Baskets\_Part\_1 | Moderator(Nokia) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412808 | Topic summary for [112][106] NR\_Baskets\_Part\_2 | Moderator(Ericsson) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412809 | Topic summary for [112][107] LTE\_Baskets | Moderator(Huawei) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412810 | Topic summary for [112][108] HPUE\_NR\_band | Moderator(CMCC) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412811 | Topic summary for [112][109] HPUE\_LTE\_band | Moderator(Nokia) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412812 | Topic summary for [112][110] HPUE\_Basket\_EN-DC | Moderator(China Unicom) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412813 | Topic summary for [112][111] HPUE\_Basket\_CADC\_SUL | Moderator(China Telecom) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412814 | Topic summary for [112][112] LTE\_NR\_Other\_basket | Moderator(Huawei) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412815 | Topic summary for [112][113] NR\_LTE\_TN\_Bands | Moderator(Nokia) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412816 | Topic summary for [112][114] NR\_IoT\_NTN\_Bands | Moderator(Inmarsat) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412817 | Topic summary for [112][115] NR\_n28\_PC2\_40MHz | Moderator(CMCC) | other | Information | [112][100] Main Session | 7.1 |  |  |
| R4-2412818 | Topic summary for [112][116] NR\_ENDC\_RF\_Ph4\_part1 | Moderator(Huawei) | other | Information | [112][100] Main Session | 8.1.3 |  |  |
| R4-2412819 | Topic summary for [112][117] NR\_ENDC\_RF\_Ph4\_part2 | Moderator(Samsung) | other | Information | [112][100] Main Session | 8.1.3 |  |  |
| R4-2412820 | Topic summary for [112][118] NR\_ENDC\_RF\_Ph4\_part3 | Moderator(AT&T) | other | Information | [112][100] Main Session | 8.1.3 |  |  |
| R4-2412821 | Topic summary for [112][119] FS\_NR\_IMT\_part1 | Moderator(Ericsson) | other | Information | [112][100] Main Session | 8.2.6 |  |  |
| R4-2412822 | Topic summary for [112][120] FS\_NR\_IMT\_part2 | Moderator(Nokia) | other | Information | [112][100] Main Session | 8.2.6 |  |  |
| R4-2412823 | Topic summary for [112][121] NR\_SL\_ intraB\_CA\_ITS\_part1 | Moderator(OPPO) | other | Information | [112][100] Main Session | 8.3.4 |  |  |
| R4-2412824 | Topic summary for [112][122] NR\_SL\_ intraB\_CA\_ITS\_part2 | Moderator(LGE) | other | Information | [112][100] Main Session | 8.3.4 |  |  |
| R4-2412825 | Topic summary for [112][123] NR\_FR1\_5MHz\_BW\_Ph2 | Moderator(Intel) | other | Information | [112][100] Main Session | 8.4.4 |  |  |
| R4-2412826 | Topic summary for [112][124] NonCol\_intraB\_ENDC\_NR\_CA | Moderator(KDDI) | other | Information | [112][100] Main Session | 8.5.4 |  |  |
| R4-2412827 | Topic summary for [112][125] FS\_NR\_DL\_Frag\_Carrier | Moderator(Mediatek) | other | Information | [112][100] Main Session | 8.6.4 |  |  |
| R4-2412828 | Topic summary for [112][126] NR\_PC2\_RedCap\_UE | Moderator(China Telecom) | other | Information | [112][100] Main Session | 8.7.3 |  |  |
| R4-2412829 | Topic summary for [112][127] NR\_IoT\_NTN\_HPUE | Moderator(Samsung) | other | Information | [112][100] Main Session | 8.8.5 |  |  |
| R4-2412830 | Topic summary for [112][128] NR\_ATG\_enh | Moderator(CMCC) | other | Information | [112][100] Main Session | 8.10.5 |  |  |
| R4-2412831 | Topic summary for [112][129] NR\_AIML\_air | Moderator(Qualcomm) | other | Information | [112][100] Main Session | 8.17.5 |  |  |
| R4-2412832 | Topic summary for [112][130] NR\_MIMO\_Ph5\_UE | Moderator(Samsung) | other | Information | [112][100] Main Session | 8.18.4 |  |  |
| R4-2412833 | Topic summary for [112][131] FS\_Ambient\_IoT\_solutions\_part1 | Moderator(CMCC) | other | Information | [112][100] Main Session | 8.20.4 |  |  |
| R4-2412834 | Topic summary for [112][132] FS\_Ambient\_IoT\_solutions\_part2 | Moderator(Huawei) | other | Information | [112][100] Main Session | 8.20.4 |  |  |
| R4-2412835 | Topic summary for [112][133] NR\_LPWUS\_UERF | Moderator(VIVO) | other | Information | [112][100] Main Session | 8.22.5 |  |  |
| R4-2412836 | Topic summary for [112][134] NR\_reply\_LS\_UE\_RF | Moderator(Apple) | other | Information | [112][100] Main Session | 9.3 |  |  |
| R4-2412837 | Topic summary for [112][135] UERF\_Spec\_Improvement | Moderator(Qualcomm) | Information | [112][100] Main Session | Information | 10.1 |  |  |

3A.2 RRM session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Type** | **For** | **Abstract** | **AI** | **TDoc Status** | **Decision** |
| R4-2411796 | Topic summary for [112][201] Maintenance\_up\_to\_R17 | Moderator (Huawei) | other | Information | [112][200] RRM Session | 4.1 |  |  |
| R4-2411797 | Topic summary for [112][202] Maintenance\_R18 | Moderator (Apple) | other | Information | [112][200] RRM Session | 5.1 |  |  |
| R4-2411798 | Topic summary for [112][203] FR2\_multiRx | Moderator (vivo) | other | Information | [112][200] RRM Session | 5.13.4 |  |  |
| R4-2411799 | Topic summary for [112][204] NR\_RRM\_enh3 | Moderator (Apple) | other | Information | [112][200] RRM Session | 5.14.3 |  |  |
| R4-2411800 | Topic summary for [112][205] NR\_MG\_enh2 | Moderator (MediaTek) | other | Information | [112][200] RRM Session | 5.15.3 |  |  |
| R4-2411801 | Topic summary for [112][206] NR\_NTN\_enh | Moderator (Qualcomm) | other | Information | [112][200] RRM Session | 5.23.9 |  |  |
| R4-2411802 | Topic summary for [112][207] NR\_Mob\_enh2 | Moderator (MediaTek) | other | Information | [112][200] RRM Session | 5.24.3 |  |  |
| R4-2411803 | Topic summary for [112][208] NR\_MIMO\_evo\_DL\_UL | Moderator (Samsung) | other | Information | [112][200] RRM Session | 5.27.4 |  |  |
| R4-2411804 | Topic summary for [112][209] Netw\_Energy\_NR | Moderator (Huawei) | other | Information | [112][200] RRM Session | 5.29.4 |  |  |
| R4-2411805 | Topic summary for [112][210] NR\_pos\_enh2\_part1 | Moderator (Ericsson) | other | Information | [112][200] RRM Session | 6.1.3 |  |  |
| R4-2411806 | Topic summary for [112][211] NR\_pos\_enh2\_part2 | Moderator (CATT) | other | Information | [112][200] RRM Session | 6.1.3 |  |  |
| R4-2411807 | Topic summary for [112][212] NR\_pos\_enh2\_part3 | Moderator (Huawei) | other | Information | [112][200] RRM Session | 6.1.3 |  |  |
| R4-2411808 | Topic summary for [112][213] NR\_ENDC\_RF\_Ph4 | Moderator (Huawei) | other | Information | [112][200] RRM Session | 8.1.3 |  |  |
| R4-2411809 | Topic summary for [112][214] NR\_FR1\_lessthan\_5MHz\_BW\_Ph2 | Moderator (Intel) | other | Information | [112][200] RRM Session | 8.4.4 |  |  |
| R4-2411810 | Topic summary for [112][215] NonCol\_intraB\_ENDC\_NR\_CA\_Ph2 | Moderator (Huawei) | other | Information | [112][200] RRM Session | 8.5.4 |  |  |
| R4-2411811 | Topic summary for [112][216] NR\_IoT\_NTN\_req\_test\_enh | Moderator (Xiaomi) | other | Information | [112][200] RRM Session | 8.8.5 |  |  |
| R4-2411812 | Topic summary for [112][217] NR\_ATG\_enh | Moderator (CMCC) | other | Information | [112][200] RRM Session | 8.10.5 |  |  |
| R4-2411813 | Topic summary for [112][218] NR\_RRM\_Ph5\_Part1 | Moderator (Apple) | other | Information | [112][200] RRM Session | 8.15.4 |  |  |
| R4-2411814 | Topic summary for [112][219] NR\_RRM\_Ph5\_Part2 | Moderator (CATT) | other | Information | [112][200] RRM Session | 8.15.4 |  |  |
| R4-2411815 | Topic summary for [112][220] NR\_MIMO\_Ph5 | Moderator (Samsung) | other | Information | [112][200] RRM Session | 8.18.4 |  |  |
| R4-2411816 | Topic summary for [112][221] NR\_duplex\_evo | Moderator (Huawei) | other | Information | [112][200] RRM Session | 8.19.4 |  |  |
| R4-2411817 | Topic summary for [112][222] Netw\_Energy\_NR\_enh | Moderator (Ericsson) | other | Information | [112][200] RRM Session | 8.21.3 |  |  |
| R4-2411818 | Topic summary for [112][223] NR\_LPWUS | Moderator (vivo) | other | Information | [112][200] RRM Session | 8.22.5 |  |  |
| R4-2411819 | Topic summary for [112][224] NR\_Mob\_Ph4 | Moderator (Apple) | other | Information | [112][200] RRM Session | 8.23.3 |  |  |
| R4-2411820 | Topic summary for [112][225] NR\_XR\_Ph3 | Moderator (Nokia) | other | Information | [112][200] RRM Session | 8.24.3 |  |  |
| R4-2411821 | Topic summary for [112][226] NR\_NTN\_Ph3 | Moderator (CATT) | other | Information | [112][200] RRM Session | 8.25.5 |  |  |
| R4-2411822 | Topic summary for [112][227] IoT\_NTN\_Ph3 | Moderator (MediaTek) | other | Information | [112][200] RRM Session | 8.26.4 |  |  |
| R4-2411823 | Topic summary for [112][228] Reply\_LS | Moderator (Apple) | other | Information | [112][200] RRM Session | 9.3 | not used | withdrawn |
| R4-2411824 | Topic summary for [112][229] RRM\_Spec\_Improvement | Moderator (Apple) | other | Information | [112][200] RRM Session | 10.1 |  |  |

3A.3 BSRF\_Demod session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Type** | **For** | **Abstract** | **AI** | **TDoc Status** | **Decision** |
| R4-2413401 | Topic summary for [112][301] BSRF\_Maintenance | Moderator (Ericsson) | other | Information | [112][300] BDaT Session | 4.1 |  |  |
| R4-2413402 | Topic summary for [112][302] NR\_NTN\_enh\_SAN\_RF | Moderator (Ericsson) | other | Information | [112][300] BDaT Session | 5.23.9 |  |  |
| R4-2413403 | Topic summary for [112][303] NR\_NTN\_enh\_SysParams\_Coex\_UERF | Moderator (Samsung) | other | Information | [112][300] BDaT Session | 5.23.9 |  |  |
| R4-2413404 | Topic summary for [112][304] NR\_netcon\_repeater\_RF | Moderator (CATT) | other | Information | [112][300] BDaT Session | 5.31.7 |  |  |
| R4-2413405 | Topic summary for [112][305] NR\_BS\_RF | Moderator (ZTE) | other | Information | [112][300] BDaT Session | 8.11.5 |  |  |
| R4-2413406 | Topic summary for [112][306] NR\_ATG\_enh | Moderator (ZTE) | other | Information | [112][300] BDaT Session | 8.10.5 |  |  |
| R4-2413407 | Topic summary for [112][307] NR\_duplex\_evo\_General | Moderator (Samsung) | other | Information | [112][300] BDaT Session | 8.19.4 |  |  |
| R4-2413408 | Topic summary for [112][308] NR\_duplex\_evo\_BSRF | Moderator (Huawei) | other | Information | [112][300] BDaT Session | 8.19.4 |  |  |
| R4-2413409 | Topic summary for [112][309] NR\_LPWUS | Moderator (Huawei) | other | Information | [112][300] BDaT Session | 8.22.5 |  |  |
| R4-2413410 | Topic summary for [112][310] NR\_NTN\_Ph3\_General\_SAN\_RF | Moderator (Thales) | other | Information | [112][300] BDaT Session | 8.25.5 |  |  |
| R4-2413411 | Topic summary for [112][311] NR\_NTN\_Ph3\_UE\_RF | Moderator (Qualcomm) | other | Information | [112][300] BDaT Session | 8.25.5 |  |  |
| R4-2413412 | Topic summary for [112][312] NR\_IoT\_NTN\_less\_than\_5MHz\_UERF | Moderator (Xiaomi) | other | Information | [112][300] BDaT Session | 8.8.5 |  |  |
| R4-2413413 | Topic summary for [112][313] NR\_IoT\_NTN\_less\_than\_5MHz\_BSRF | Moderator (Nokia) | other | Information | [112][300] BDaT Session | 8.8.5 |  |  |
| R4-2413414 | Topic summary for [112][314] NR\_NTN\_Ku\_Band\_General | Moderator (Eutelsat) | other | Information | [112][300] BDaT Session | 8.9.6 |  |  |
| R4-2413415 | Topic summary for [112][315] NR\_NTN\_Ku\_Band\_UE\_SAN\_RF | Moderator (CHTTL) | other | Information | [112][300] BDaT Session | 8.9.6 |  |  |
| R4-2413416 | Topic summary for [112][316] IoT\_NTN\_Ph3 | Moderator (MediaTek) | other | Information | [112][300] BDaT Session | 8.26.4 |  |  |
| R4-2413417 | Topic summary for [112][317] Demod\_Maintenance | Moderator (Nokia) | other | Information | [112][300] BDaT Session | 4.1 |  |  |
| R4-2413418 | Topic summary for [112][318] RF\_FR1\_enh2\_Demod | Moderator (Huawei) | other | Information | [112][300] BDaT Session | 5.9.4 |  |  |
| R4-2413419 | Topic summary for [112][319] NR\_FR1\_lessthan\_5MHz\_BW\_demod | Moderator (Nokia) | other | Information | [112][300] BDaT Session | 5.11.5 |  |  |
| R4-2413420 | Topic summary for [112][320] NR\_demod\_enh3\_Part1 | Moderator (China Telecom) | other | Information | [112][300] BDaT Session | 5.19.4 |  |  |
| R4-2413421 | Topic summary for [112][321] NR\_NTN\_enh\_SAN\_UE\_demod | Moderator (Huawei) | other | Information | [112][300] BDaT Session | 5.23.9 |  |  |
| R4-2413422 | Topic summary for [112][322] NR\_cov\_enh2\_demod | Moderator (China Telecom) | other | Information | [112][300] BDaT Session | 5.21.3 |  |  |
| R4-2413423 | Topic summary for [112][323] NR\_MIMO\_evo\_DL\_UL\_demod | Moderator (Samsung) | other | Information | [112][300] BDaT Session | 5.27.4 |  |  |
| R4-2413424 | Topic summary for [112][324] NR\_redcap\_enh\_demod | Moderator (Ericsson) | other | Information | [112][300] BDaT Session | 5.28.3 |  |  |
| R4-2413425 | Topic summary for [112][325] NR\_mobile\_IAB\_demod | Moderator (Ericsson) | other | Information | [112][300] BDaT Session | 5.32.5 |  |  |
| R4-2413426 | Topic summary for [112][326] NR\_DSS\_enh | Moderator (Ericsson) | other | Information | [112][300] BDaT Session | 5.33.2 |  |  |
| R4-2413427 | Topic summary for [112][327] NR\_SCM | Moderator (Nokia) | other | Information | [112][300] BDaT Session | 8.14.3 |  |  |
| R4-2413428 | Topic summary for [112][328] NR\_demod\_Ph5 | Moderator (China Telecom) | other | Information | [112][300] BDaT Session | 8.16.4 |  |  |
| R4-2413429 | Topic summary for [112][329] NTN\_testing\_NGSO\_channel\_model | Moderator (Samsung) | other | Information | [112][300] BDaT Session | 8.8.5 |  |  |
| R4-2413430 | Topic summary for [112][330] OTA\_Maintenance | Moderator (Keysight) | other | Information | [112][300] BDaT Session | 4.1 |  |  |
| R4-2413431 | Topic summary for [112][331] NR\_FR1\_TRP\_TRS\_enh | Moderator (vivo) | other | Information | [112][300] BDaT Session | 6.2.3 |  |  |
| R4-2413432 | Topic summary for [112][332] NR\_MIMO\_OTA\_enh | Moderator (CAICT) | other | Information | [112][300] BDaT Session | 5.18.4 |  |  |
| R4-2413433 | Topic summary for [112][333] TRP\_TRS\_MIMO\_OTA | Moderator (vivo) | other | Information | [112][300] BDaT Session | 8.12.4 |  |  |
| R4-2413434 | Topic summary for [112][334] NR\_FR2\_OTA | Moderator (Qualcomm) | other | Information | [112][300] BDaT Session | 8.13.3 |  |  |

## 4 Up to Rel-17 maintenance for LTE and NR

The following guidance are provided for maintenance work under AI 4 ~ AI 5:

‒ For maintenance agenda AI 4 (Rel-15/16/17) and AI 5 (Rel-18), formal CRs are expected and multiple CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

‒ When submitting contributions to AI 4, AI 5.2, AI 5.34, please add (WI\_code) in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

‒ When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a draft CR with TEI as WI code, please inform session chair.

‒ For all the endorsed draft CRs in this bis meeting, please re-submit them in the next ordinary meeting.

‒ The contributions corresponding to incoming LS for Rel-15/16/17 are expected to be submitted in AI 9.

‒ The contributions corresponding to incoming LS for Rel-18/19 are expected to be submitted to (sub-) agenda dedicated to the individual WIs. If there is no dedicated agenda, please submit to AI 5.2 or AI 5.34 depending on whether it is spectrum related topic or non-spectrum related topic.

**R4-2412412 CR on MSD value correction for power class 5 cross band isolation**

*Type: CR For: Agreement  
 38.101-1 v17.14.0 CR-2430 rev Cat: F (Rel-17)  
  
 Source: LG Electronics France*

**Decision:** The document was **not treated**.

**R4-2412425 CR on MSD value correction for power class 5 cross band isolation**

*Type: CR For: Agreement  
 38.101-1 v17.14.0 CR-2431 rev Cat: A (Rel-17)  
  
 Source: LG Electronics France*

**Decision:** The document was **withdrawn**.

**R4-2412430 CR on MSD value correction for power class 5 cross band isolation**

*Type: CR For: Agreement  
 38.101-1 v18.6.0 CR-2432 rev Cat: A (Rel-18)  
  
 Source: LG Electronics France*

**Decision:** The document was **not treated**.

### 4.1 Moderator summary and conclusions (for Agenda 4)

**R4-2413401 Topic summary for [112][301] BSRF\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[112] BDaT Session AI 4.3, 4.4, 5.8.2, 5.11.2, 5.12.2, 5.30.1, 5.32.1, 5.32.2, 5.34.2

**Decision: Noted**

**R4-2413417 Topic summary for [112][317] Demod\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

[112] BDaT Session AI 4.6, 5.8.4, 5.10.2, 5.12.4, 5.13.3, 5.17.2, 5.22.3, 5.29.3, 5.30.3, 5.31.6, 5.34.4

**Decision: Noted**

**R4-2413531 Ad-hoc meeting minutes for [112][317] Demod\_Maintenance**

*Type: For: Information  
   
 Source: Nokia*

**Abstract:**

**Decision: Noted**

**R4-2413430 Topic summary for [112][330] OTA\_Maintenance**

*Type: other For: Information  
 Source: Moderator (Keysight)*

**Abstract:**

[112] BDaT Session AI 4.7

**Decision: Noted**

### 4.2 UE RF requirements

### 4.3 BS RF requirements and BS conformance testing

**R4-2411050 CR for TS 38.108, Correction on NTN SAN requirement reference points**

*Type: CR For: Agreement  
 38.108 v17.8.0 CR-0079 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Abstract:**

MCC: A revision is needed due to parsing failure. Change request Work Item wrong on CR cover for TDoc R4-2411050. Database value : NR\_NTN\_solutions-Core. CR cover value : NR\_NTN\_Solution-Core. Check the CR coversheet WI code to match database value.

**Decision: Postponed**

**R4-2411051 CR for TS 38.181, Correction on NTN SAN requirement reference points**

*Type: CR For: Agreement  
 38.181 v17.5.0 CR-0033 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Abstract:**

MCC: A revision is needed due to parsing failure. Change request Work Item wrong on CR cover for TDoc R4-2411051. Database value : NR\_NTN\_solutions-Perf. CR cover value : NR\_NTN\_Solution-Perf. Please check the WI code and match to database value.

**Decision: Postponed**

**R4-2411223 (NR\_6GHz\_unlic\_EU-Core) CR to 38.104 on ACLR and CACLR in non-contiguous spectrum**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0649 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In the preamble to ACLR and CACLR, the context of the applicability statement is non-specific and even giving the impression that both ACLR and CLCLR throughout the clause shall apply, while in fact the two requirements are mutually exclusive. It is therefore clarified that either ACLR or CACLR shall apply, depending on the sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies.

**Decision: Revised to R4-2413538 (from R4-2411223)**

**R4-2413538 (NR\_6GHz\_unlic\_EU-Core) CR to 38.104 on ACLR and CACLR in non-contiguous spectrum**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0649 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

In the preamble to ACLR and CACLR, the context of the applicability statement is non-specific and even giving the impression that both ACLR and CLCLR throughout the clause shall apply, while in fact the two requirements are mutually exclusive. It is therefore clarified that either ACLR or CACLR shall apply, depending on the sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies.

**Decision: Agreed**

**R4-2411224 (NR\_6GHz\_unlic\_EU-Core) CR to 38.104 on ACLR and CACLR in non-contiguous spectrum**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0650 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

MCC: This is CAT A CR. In the preamble to ACLR and CACLR, the context of the applicability statement is non-specific and even giving the impression that both ACLR and CLCLR throughout the clause shall apply, while in fact the two requirements are mutually exclusive. It is therefore clarified that either ACLR or CACLR shall apply, depending on the sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies.

**Decision: Agreed**

**R4-2411225 (NR\_6GHz\_unlic\_EU-Core) CR to 38.141-1 on ACLR and CACLR in non-contiguous spectrum**

*Type: CR For: Agreement  
 38.141-1 v17.14.0 CR-0458 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

In the preamble to ACLR and CACLR, the context of the applicability statement is non-specific and even giving the impression that both ACLR and CLCLR throughout the clause shall apply, while in fact the two requirements are mutually exclusive. It is therefore clarified that either ACLR or CACLR shall apply, depending on the sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies.

**Decision: Revised to R4-2413539 (from R4-2411225)**

**R4-2413539 (NR\_6GHz\_unlic\_EU-Core) CR to 38.141-1 on ACLR and CACLR in non-contiguous spectrum**

*Type: CR For: Agreement  
 38.141-1 v17.14.0 CR-0458 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

In the preamble to ACLR and CACLR, the context of the applicability statement is non-specific and even giving the impression that both ACLR and CLCLR throughout the clause shall apply, while in fact the two requirements are mutually exclusive. It is therefore clarified that either ACLR or CACLR shall apply, depending on the sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies.

**Decision: Agreed**

**R4-2411226 (NR\_6GHz\_unlic\_EU-Core) CR to 38.141-1 on ACLR and CACLR in non-contiguous spectrum**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0459 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

MCC: This is CAT A CR. In the preamble to ACLR and CACLR, the context of the applicability statement is non-specific and even giving the impression that both ACLR and CLCLR throughout the clause shall apply, while in fact the two requirements are mutually exclusive. It is therefore clarified that either ACLR or CACLR shall apply, depending on the sub-block or Inter RF Bandwidth gap size (Wgap) where the limit applies.

**Decision: Agreed**

**R4-2412298 (NR\_NTN\_solutions-Core) CR to 38.108 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.108 v17.8.0 CR-0085 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" in all sections

**Decision: Revised to R4-2413540 (from R4-2412298)**

**R4-2413540 (NR\_NTN\_solutions-Core) CR to 38.108 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.108 v17.8.0 CR-0085 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

replace "FR1" by "FR1-NTN" in all sections

**Decision: Agreed**

**R4-2412299 (NR\_NTN\_solutions-Core) CR to 38.108 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0086 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" in all sections. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412300 (NR\_NTN\_solutions-Core) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v17.5.0 CR-0037 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" in all sections

**Decision: Revised to R4-2413541 (from R4-2412300)**

**R4-2413541 (NR\_NTN\_solutions-Core) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v17.5.0 CR-0037 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

replace "FR1" by "FR1-NTN" in all sections

**Decision: Agreed**

**R4-2412301 (NR\_NTN\_solutions-Core) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0038 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" in all sections. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412341 (NR\_bands\_R17\_BWs-Core) CR to 38.104: Correction of regional requirement table**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0653 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413542 (from R4-2412341)**

**R4-2413542 (NR\_bands\_R17\_BWs-Core) CR to 38.104: Correction of regional requirement table**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0653 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413607 (from R4-2413542)**

**R4-2413607 (NR\_bands\_R17\_BWs-Core) CR to 38.104: Correction of regional requirement table**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0653 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2412342 (NR\_bands\_R17\_BWs-Core) CR to 38.141-1: Correction of regional requirement table**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0464 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413543 (from R4-2412342)**

**R4-2413543 (NR\_bands\_R17\_BWs-Core) CR to 38.141-1: Correction of regional requirement table**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0464 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413608 (from R4-2413543)**

**R4-2413608 (NR\_bands\_R17\_BWs-Core) CR to 38.141-1: Correction of regional requirement table**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0464 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2412343 (NR\_bands\_R17\_BWs-Core) CR to 38.141-2: Correction of regional requirement for tx intermodulation**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0597 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413544 (from R4-2412343)**

**R4-2413544 (NR\_bands\_R17\_BWs-Core) CR to 38.141-2: Correction of regional requirement for tx intermodulation**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0597 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413609 (from R4-2413544)**

**R4-2413609 (NR\_bands\_R17\_BWs-Core) CR to 38.141-2: Correction of regional requirement for tx intermodulation**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0597 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2412344 (NR\_IAB-Perf) CR to 38.176-2: Correction of ACLR absolute limit**

*Type: CR For: Agreement  
 38.176-2 v16.10.0 CR-0060 rev Cat: F (Rel-16)  
  
 Source: NEC*

**Decision: Revised to R4-2413571 (from R4-2412344)**

**R4-2413571 (NR\_IAB-Perf) CR to 38.176-2: Correction of ACLR absolute limit**

*Type: CR For: Agreement  
 38.176-2 v16.10.0 CR-0060 rev Cat: F (Rel-16)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2412345 (NR\_IAB-Perf) CR to 38.176-2: Correction of ACLR absolute limit**

*Type: CR For: Agreement  
 38.176-2 v17.9.0 CR-0061 rev Cat: A (Rel-17)  
  
 Source: NEC*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412346 (NR\_IAB-Perf) CR to 38.176-2: Correction of ACLR absolute limit**

*Type: CR For: Agreement  
 38.176-2 v18.5.0 CR-0062 rev Cat: A (Rel-18)  
  
 Source: NEC*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412484 CR for TS 38.108, Correction on NTN SAN requirement reference points**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0088 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412485 CR for TS 38.181, Correction on NTN SAN requirement reference points**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0041 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412580 (LTE410\_Europe\_PPDR-Perf) CR to TS 37.145-2 on correction of transmitter co-location requirements for bands 87 and 88**

*Type: CR For: Agreement  
 37.145-2 v16.18.0 CR-0383 rev Cat: F (Rel-16)  
  
 Source: Nokia*

**Abstract:**

Use uplink frequency range in the transmitter co-location requirements for bands 87 and 88.

**Decision: Agreed**

**R4-2412581 (LTE410\_Europe\_PPDR-Perf) CR to TS 37.145-2 on correction of transmitter co-location requirements for bands 87 and 88**

*Type: CR For: Agreement  
 37.145-2 v17.12.0 CR-0384 rev Cat: A (Rel-17)  
  
 Source: Nokia*

**Abstract:**

Use uplink frequency range in the transmitter co-location requirements for bands 87 and 88. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412582 (LTE410\_Europe\_PPDR-Perf) CR to TS 37.145-2 on correction of transmitter co-location requirements for bands 87 and 88**

*Type: CR For: Agreement  
 37.145-2 v18.6.0 CR-0385 rev Cat: A (Rel-18)  
  
 Source: Nokia*

**Abstract:**

Use uplink frequency range in the transmitter co-location requirements for bands 87 and 88. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412583 (NR\_RAIL\_EU\_900MHz-Core, NR\_RAIL\_EU\_1900MHz\_TDD-Core) CR to TS 38.104 on clarification on multiple carrier operation for bands n100 and n101**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0654 rev Cat: F (Rel-17)  
  
 Source: Nokia, UIC, Vodafone*

**Abstract:**

Align the text related to multiple carrier operation in bands n100 and n101 with the approved LS to ECC WG FM in R4-2410001.

**Decision: Agreed**

**R4-2412584 (NR\_RAIL\_EU\_900MHz-Core, NR\_RAIL\_EU\_1900MHz\_TDD-Core) CR to TS 38.104 on clarification on multiple carrier operation for bands n100 and n101**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0655 rev Cat: A (Rel-18)  
  
 Source: Nokia, UIC, Vodafone*

**Abstract:**

Align the text related to multiple carrier operation in bands n100 and n101 with the approved LS to ECC WG FM in R4-2410001. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412585 (NR\_RAIL\_EU\_900MHz-Perf, NR\_RAIL\_EU\_1900MHz\_TDD-Perf) CR to TS 38.141-1 on clarification on multiple carrier operation for bands n100 and n101**

*Type: CR For: Agreement  
 38.141-1 v17.14.0 CR-0465 rev Cat: F (Rel-17)  
  
 Source: Nokia, UIC, Vodafone*

**Abstract:**

Align the text related to multiple carrier operation in bands n100 and n101 with the approved LS to ECC WG FM in R4-2410001.

**Decision: Agreed**

**R4-2412586 (NR\_RAIL\_EU\_900MHz-Perf, NR\_RAIL\_EU\_1900MHz\_TDD-Perf) CR to TS 38.141-1 on clarification on multiple carrier operation for bands n100 and n101**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0466 rev Cat: A (Rel-18)  
  
 Source: Nokia, UIC, Vodafone*

**Abstract:**

Align the text related to multiple carrier operation in bands n100 and n101 with the approved LS to ECC WG FM in R4-2410001. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412987 (NR\_IAB-Perf) CR for TS 38.176-2, removal of scaling factor note 1 for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v16.10.0 CR-0063 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Decision: Merged**

**R4-2412988 (NR\_IAB-Perf) CR for TS 38.176-2, removal of scaling factor note 1 for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v17.9.0 CR-0064 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412989 (NR\_IAB-Perf) CR for TS 38.176-2, removal of scaling factor note 1 for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v18.5.0 CR-0065 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2413248 (NR\_RAIL\_EU\_900MHz-Core) Analysis of the updated ECC/DEC/(20)02 decision**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide analysis of recent ECC/DEC/(20)02 modifications, with related proposal on their implementation.

**Decision: Noted**

**R4-2413249 (NR\_RAIL\_EU\_900MHz-Core) Updated ECC/DEC/(20)02 decision**

*Type: CR For: Agreement  
 38.853 v17.4.0 CR-0013 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide updates due to recent corrections in the ECC/DEC/(20)02 decision.

**Decision: Agreed**

**R4-2413250 (NR\_SUL\_UL\_n24-Core) Missing reference to FCC Order DA 20-48**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0658 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Adding missing reference to the FCC Order DA 20-48.

**Decision: Agreed**

**R4-2413251 (NR\_SUL\_UL\_n24-Core) Missing reference to FCC Order DA 20-48**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0659 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Adding missing reference to the FCC Order DA 20-48. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413252 (NR\_newRAT-Core) Fixing notes numbering in Table 5.2-1**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0660 rev Cat: D (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we are fixing a bug originating from conflicting CRs implementation.

**Decision: Agreed**

**R4-2413253 (NR\_newRAT-Core) Fixing notes numbering in Table 5.2-1**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0661 rev Cat: D (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we are fixing a bug originating from conflicting CRs implementation.

**Decision: Not pursued**

**R4-2413256 Clarification on extreme conditions**

*Type: CR For: Agreement  
 38.106 v17.9.0 CR-0092 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we introduce missing information, pointing to related test specification, where normal and extreme test conditions are specified. Additionally, clarification on normal conditions being default is added.

**Decision: Revised to R4-2413572 (from R4-2413256)**

**R4-2413572 Clarification on extreme conditions**

*Type: CR For: Agreement  
 38.106 v17.9.0 CR-0092 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

Abstract:

In this CR we introduce missing information, pointing to related test specification, where normal and extreme test conditions are specified. Additionally, clarification on normal conditions being default is added.

**Decision: Agreed**

**R4-2413257 Clarification on extreme conditions**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0093 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we introduce missing information, pointing to related test specification, where normal and extreme test conditions are specified. Additionally, clarification on normal conditions being default is added.

**Decision: Revised to R4-2413573 (from R4-2413257)**

**R4-2413573 Clarification on extreme conditions**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0093 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

Abstract:

In this CR we introduce missing information, pointing to related test specification, where normal and extreme test conditions are specified. Additionally, clarification on normal conditions being default is added.

**Decision: Agreed**

**R4-2413285 (TEI17) CR to TS 38.104 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0662 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413545 (from R4-2413285)**

**R4-2413545 (TEI17) CR to TS 38.104 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.104 v17.14.0 CR-0662 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2413286 (TEI17)CR to TS 38.104 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0663 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413287 (TEI17)CR to TS 38.141-1 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.141-1 v17.14.0 CR-0471 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413546 (from R4-2413287)**

**R4-2413546 (TEI17)CR to TS 38.141-1 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.141-1 v17.14.0 CR-0471 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2413288 (TEI17)CR to TS 38.141-1 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0472 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413289 (TEI17)CR to TS 38.141-2 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.141-2 v17.14.0 CR-0598 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413547 (from R4-2413289)**

**R4-2413547 (TEI17)CR to TS 38.141-2 - BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.141-2 v17.14.0 CR-0598 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2413290 (TEI17)CR to TS 38.141-2- BS spurious receiver protection note**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0599 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

### 4.4 UE/BS EMC requirements

### 4.5 RRM requirements

### 4.6 Demodulation and CSI requirements

**R4-2411029 (NR\_DL1024QAM\_FR1-Perf) CR for TS38.101-4, corrections to CodebookSubsetRestriction on 1024QAM CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0568 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2413548 (from R4-2411029)**

**R4-2413548 (NR\_DL1024QAM\_FR1-Perf) CR for TS38.101-4, corrections to CodebookSubsetRestriction on 1024QAM CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0568 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2411030 (NR\_DL1024QAM\_FR1-Perf) CR for TS38.101-4, corrections to CodebookSubsetRestriction on 1024QAM CQI requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0569 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411278 (NR\_newRAT-Perf) Views on QPSK PDSCH demodulation test with PTRS configuration**

*Type: other For: Approval  
 38.101-4 v CR- rev Cat: ()  
  
 Source: Anritsu Corporation*

**Abstract:**

Views on the previous dicsussion paper R4-2408987.

**Decision: Noted**

**R4-2411526 (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0577 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Not pursued**

**R4-2413549 (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0577 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn**

**R4-2411527 (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0578 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2411528 (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0579 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2411529 (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0580 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2411530 (NR\_newRAT-Perf) Discussion on PTRS configuration for FR2 PDSCH testing**

*Type: discussion For: Discussion  
 Source: Rohde & Schwarz*

**Decision: Noted**

**R4-2411662 (NR\_demod\_enh2) CR for 38.101-4 on corrections of RMC references**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0582 rev Cat: F (Rel-17)  
  
 Source: Nokia*

**Decision: Revised to R4-2413577 (from R4-2411662)**

**R4-2413577 (NR\_demod\_enh2) CR for 38.101-4 on corrections of RMC references**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0582 rev Cat: F (Rel-17)  
  
 Source: Nokia*

**Decision: Agreed**

Apple: We don’t think this CR is needed. We need to decide whether to remove the duplicated FRC.

**R4-2411663 (NR\_demod\_enh2) CR for 38.101-4 on corrections of RMC references**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0583 rev Cat: A (Rel-18)  
  
 Source: Nokia*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412155 (NR\_IAB-Perf) CR to 38.176-1 Correction on the IAB requirement**

*Type: CR For: Agreement  
 38.176-1 v17.9.0 CR-0057 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the reference channel index MCC: A revision is needed due to parsing failure. Change request Work Item wrong on CR cover for TDoc R4-2412155. Database value : NR\_IAB-Perf. CR cover value : NR \_IAB-Perf. Please check the WI code and match

**Decision: Revised to R4-2413550 (from R4-2412155)**

**R4-2413550 (NR\_IAB-Perf) CR to 38.176-1 Correction on the IAB requirement**

*Type: CR For: Agreement  
 38.176-1 v17.9.0 CR-0057 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR corrects the reference channel index MCC: A revision is needed due to parsing failure. Change request Work Item wrong on CR cover for TDoc R4-2412155. Database value : NR\_IAB-Perf. CR cover value : NR \_IAB-Perf. Please check the WI code and match

**Decision: Agreed**

**R4-2412156 (NR\_IAB-Perf) CR to 38.176-1 Correction on the IAB requirement**

*Type: CR For: Agreement  
 38.176-1 v18.5.0 CR-0058 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the reference channel index. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412294 CR for 38.108 on Demod FR1-NTN FRC alignments and propogation corrections**

*Type: CR For: Agreement  
 38.108 v17.8.0 CR-0083 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" and corrections on index refereing

**Decision: Revised to R4-2413579 (from R4-2412294)**

**R4-2413579 CR for 38.108 on Demod FR1-NTN FRC alignments and propogation corrections**

*Type: CR For: Agreement  
 38.108 v17.8.0 CR-0083 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

replace "FR1" by "FR1-NTN" and corrections on index refereing

**Decision: Agreed**

**R4-2412295 (NR\_NTN\_solutions-Perf) CR to 38.108 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0084 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" and corrections on index referencing. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412296 (NR\_NTN\_solutions-Perf) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v17.5.0 CR-0035 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" and corrections on index refereing

**Decision: Revised to R4-2413580 (from R4-2412296)**

**R4-2413580 (NR\_NTN\_solutions-Perf) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v17.5.0 CR-0035 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

replace "FR1" by "FR1-NTN" and corrections on index refereing

**Decision: Agreed**

**R4-2412297 (NR\_NTN\_solutions-Perf) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0036 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

replace "FR1" by "FR1-NTN" and corrections on index referencing. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412323 (NR\_newRAT-Perf) CR to Rel-18 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0591 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2413581 (NR\_newRAT-Perf) CR to Rel-18 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0591 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2412324 (NR\_newRAT-Perf) CR to Rel-17 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0592 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2413582 (NR\_newRAT-Perf) CR to Rel-17 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0592 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2412325 (NR\_newRAT-Perf) CR to Rel-16 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0593 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2413583 (from R4-2412325)**

**R4-2413583 (NR\_newRAT-Perf) CR to Rel-16 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0593 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

Qualcomm: Change is required to be consistent across all codebooks

**R4-2412326 (NR\_newRAT-Perf) CR to Rel-15 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0594 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2413584 (from R4-2412326)**

**R4-2413584 (NR\_newRAT-Perf) CR to Rel-15 38.101-4 Frequency domain granularity of random PMI for PMI requirements**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0594 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2412408 (NR\_newRAT-Perf) Discussion on PT-RS configuration in FR2 QPSK PDSCH demodulation requirements**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2412545 (NR\_redcap) Correction of applicability of RedCap UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0596 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR correct the applicability of RedCap UE demodulation requirements.

**Decision: Agreed**

**R4-2412546 (NR\_redcap) Correction of applicability of RedCap UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0597 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR correct the applicability of RedCap UE demodulation requirements. MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412740 (NR\_demod\_enh2-Perf) Corrections on CQI requirements with inter-cell interference**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0599 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413551 (from R4-2412740)**

**R4-2413551 (NR\_demod\_enh2-Perf) Corrections on CQI requirements with inter-cell interference**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0599 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2412741 (NR\_demod\_enh2-Perf) Corrections on CQI requirements with inter-cell interference**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0600 rev Cat: A (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412742 (NR\_HST-Perf) Corrections on NR HST test parameters**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0601 rev Cat: F (Rel-16)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413552 (from R4-2412742)**

**R4-2413552 (NR\_HST-Perf) Corrections on NR HST test parameters**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0601 rev Cat: F (Rel-16)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2412743 (NR\_HST-Perf) Corrections on NR HST test parameters**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0602 rev Cat: A (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412744 (NR\_HST-Perf) Corrections on NR HST test parameters**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0603 rev Cat: A (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412745 (NR\_newRAT-Perf) CR for 38.101-4 Corrections on test setup for FR2 PMI test**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0604 rev Cat: F (Rel-15)  
  
 Source: Huawei,HiSilicon, Ericsson*

**Decision: Postponed**

Anritsu: We do not apply beam steering to ULA. We support the CR.

Nokia: Is this for both ULA low and ULA nominal?

Anritsu: Neither of them, based on the description in the current Annex

Ericsson: We propose to remove beam steering from Rel-15, but keep it in Rel-17

Moderator: The other CR is already agreed to add ULA formulation into the Annex.

Qualcomm: We should check other TE vendors

R&S: We haven’t received feedback yet.

**R4-2412746 (NR\_newRAT-Perf) CR for 38.101-4 Corrections on test setup for FR2 PMI test**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0605 rev Cat: A (Rel-16)  
  
 Source: Huawei,HiSilicon,Ericsson*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412747 (NR\_newRAT-Perf) CR for 38.101-4 Corrections on test setup for FR2 PMI test**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0606 rev Cat: A (Rel-17)  
  
 Source: Huawei,HiSilicon,Ericsson*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412748 (NR\_newRAT-Perf) CR for 38.101-4 Corrections on test setup for FR2 PMI test**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0607 rev Cat: A (Rel-18)  
  
 Source: Huawei,HiSilicon,Ericsson*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412749 (NR\_redcap-Perf) CR for 38.101-4: Corrections on RedCap PMI test setup**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0608 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon, Ericsson*

**Decision: Agreed**

**R4-2412750 (NR\_redcap-Perf) CR for 38.101-4 Corrections on RedCap PMI test setup**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0609 rev Cat: A (Rel-18)  
  
 Source: Huawei,HiSilicon,Ericsson*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2412751 Discussions on Introduction of beam steering approach for ULA antenna configuration**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon,Ericsson*

**Decision: Noted**

**R4-2412775 (NR\_newRAT-Perf) Discussion on PTRS configuration for UE demodulation requirements**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412776 (NR\_newRAT-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0617 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413585 (from R4-2412776)**

**R4-2413585 (NR\_newRAT-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0617 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413605 (from R4-2413585)**

**R4-2413605 (NR\_newRAT-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0617 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

Nokia: We have discussed for 4 months and there are different interpretations of the specification by the delegates. But now we have aligned and it would be beneficial to clarify the spec.

Apple: What do we want to capture as the note?

Huawei: According to the core spec, the default value of L=1 applies without explicit high level signaling.

**R4-2412777 (NR\_newRAT-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0618 rev Cat: F (Rel-16)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This was not made available at tdoc submission deadline. CAT F CR.

**Decision: Agreed**

**R4-2412778 (NR\_newRAT-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0619 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This was not made available at tdoc submission deadline. CAT F CR.

**Decision: Agreed**

**R4-2412779 (NR\_newRAT-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0620 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This was not made available at tdoc submission deadline. CAT F CR.

**Decision: Agreed**

**R4-2412780 (NR\_L1enh\_URLLC-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0621 rev Cat: F (Rel-16)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413586 (from R4-2412780)**

**R4-2413586 (NR\_L1enh\_URLLC-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0621 rev Cat: F (Rel-16)  
  
 Source: Huawei,HiSilicon*

**Decision: Not pursued**

**R4-2412781 (NR\_L1enh\_URLLC-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0622 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This was not made available at tdoc submission deadline. CAT F CR.

**Decision: Withdrawn**

**R4-2412782 (NR\_L1enh\_URLLC-Perf) CR on PTRS configuration for UE demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0623 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: This was not made available at tdoc submission deadline. CAT F CR.

**Decision: Withdrawn**

**R4-2412870 [NR\_newRAT-Perf] Correction CR on applicability of FR1 demodulation requirements (Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0625 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: A revision is required due to parsing failure. Change request number wrong on CR cover for TDoc R4-2412870. Database value : 0625. CR cover value : 0530. This is a major failure due to wrong CR numbering.

**Decision: Revised to R4-2413587 (from R4-2412870)**

**R4-2413587 [NR\_newRAT-Perf] Correction CR on applicability of FR1 demodulation requirements (Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0625 rev Cat: F (Rel-18)  
  
 Source: Samsung*

Abstract:

MCC: A revision is required due to parsing failure. Change request number wrong on CR cover for TDoc R4-2412870. Database value : 0625. CR cover value : 0530. This is a major failure due to wrong CR numbering.

**Decision: Agreed**

**R4-2412871 [NR\_newRAT-Perf] Correction CR on applicability of FR1 demodulation requirements (Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0626 rev Cat: A (Rel-17)  
  
 Source: Samsung*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413588 [NR\_newRAT-Perf] Correction CR on applicability of FR1 demodulation requirements (Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0626 rev Cat: A (Rel-17)  
  
 Source: Samsung*

Abstract:

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412872 [NR\_newRAT-Perf] Correction CR on applicability of FR1 demodulation requirements (Rel-16)**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0627 rev Cat: A (Rel-16)  
  
 Source: Samsung*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413589 [NR\_newRAT-Perf] Correction CR on applicability of FR1 demodulation requirements (Rel-16)**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0627 rev Cat: A (Rel-16)  
  
 Source: Samsung*

Abstract:

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2413037 [TEI17] Correct FRC for PMI Reporting Requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0633 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2413553 (from R4-2413037)**

Apple: Why wasn’t this changed for Rel-15 and Rel-16 as well?

**R4-2413553 [TEI17] Correct FRC for PMI Reporting Requirements**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0633 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413054 [TEI17] Correct FRC for PMI Reporting Requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0634 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2413161 (NR\_newRAT-Perf) Editorial CR to 38.101-4 on PBCH requirements to unify table numbering format**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0635 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Revised to R4-2413590 (from R4-2413161)**

**R4-2413590 (NR\_newRAT-Perf) Editorial CR to 38.101-4 on PBCH requirements to unify table numbering format**

*Type: CR For: Agreement  
 38.101-4 v15.22.0 CR-0635 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Agreed**

Ericsson: We are ok with this change

**R4-2413162 (NR\_newRAT-Perf) Editorial CR to 38.101-4 on PBCH requirements to unify table numbering format**

*Type: CR For: Agreement  
 38.101-4 v16.17.0 CR-0636 rev Cat: A (Rel-16)  
  
 Source: Apple*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413163 (NR\_newRAT-Perf) Editorial CR to 38.101-4 on PBCH requirements to unify table numbering format**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0637 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2413591 (from R4-2413163)**

**R4-2413591 (NR\_newRAT-Perf) Editorial CR to 38.101-4 on PBCH requirements to unify table numbering format**

*Type: CR For: Agreement  
 38.101-4 v17.13.0 CR-0637 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Agreed**

**R4-2413164 (NR\_newRAT-Perf) Editorial CR to 38.101-4 on PBCH requirements to unify table numbering format**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0638 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2413446 [NR\_NTN\_solutions-Perf] Correction CR on performance requirements in TS 38181**

*Type: CR For: Agreement  
 38.181 v17.5.0 CR-0044 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Merged**

**R4-2413447 [NR\_NTN\_solutions-Perf] Correction CR on performance requirements in TS 38181**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0045 rev Cat: A (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2413448 [NR\_NTN\_solutions-Perf] Correction CR on performance requirements in TS 38108**

*Type: CR For: Agreement  
 38.108 v17.8.0 CR-0091 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Merged**

**R4-2413449 [NR\_NTN\_solutions-Perf] Correction CR on performance requirements in TS 38108**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0092 rev Cat: A (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

### 4.7 OTA and TRP/TRS test aspects

**R4-2411245 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 38.151 v17.8.0 CR-0043 rev Cat: F (Rel-17)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Decision: Agreed**

**R4-2411246 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 38.151 v18.1.0 CR-0044 rev Cat: A (Rel-18)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411247 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 37.144 v14.7.0 CR-0020 rev Cat: F (Rel-14)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Decision: Agreed**

**R4-2411248 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 37.144 v15.0.0 CR-0021 rev Cat: A (Rel-15)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411249 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 37.144 v16.0.0 CR-0022 rev Cat: A (Rel-16)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411250 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 37.144 v17.0.0 CR-0023 rev Cat: A (Rel-17)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411251 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 37.144 v18.0.0 CR-0024 rev Cat: A (Rel-18)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411308 UE RF Testing Procedure under NFTF Measurement Setup**

*Type: discussion For: Discussion  
 38.810 v CR- rev Cat: (Rel-16)  
  
 Source: GIST, RRA, CSU*

**Decision: Noted**

GIST: Our intention is to introduce a correction Cat F CR into TR 38.810 to explicitly indicate the Fourier transform

**R4-2412054 CR to Rel-17 TS 38.161 on preliminary MU alignment**

*Type: CR For: Agreement  
 38.161 v17.4.0 CR-0015 rev Cat: F (Rel-17)  
  
 Source: vivo, ROHDE & SCHWARZ*

**Decision: Agreed**

### 4.8 Rel-15/16/17 TEI

## 5 Rel-18 maintenance for LTE and NR closed work items

The following guidance are provided for maintenance work under AI 4 ~ AI 5:

‒ For maintenance agenda AI 4 (Rel-15/16/17) and AI 5 (Rel-18), formal CRs are expected and multiple CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

‒ When submitting contributions to AI 4, AI 5.2, AI 5.34, please add (WI\_code) in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

‒ When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a draft CR with TEI as WI code, please inform session chair.

‒ For all the endorsed draft CRs in this bis meeting, please re-submit them in the next ordinary meeting.

‒ The contributions corresponding to incoming LS for Rel-15/16/17 are expected to be submitted in AI 9.

‒ The contributions corresponding to incoming LS for Rel-18/19 are expected to be submitted to (sub-) agenda dedicated to the individual WIs. If there is no dedicated agenda, please submit to AI 5.2 or AI 5.34 depending on whether it is spectrum related topic or non-spectrum related topic.

### 5.1 Moderator summary and conclusions (for sub-AIs under AI 5 without specific agenda for moderator summary)

### 5.2 Spectrum related WI maintenance

### 5.3 NR Channel raster enhancement

### 5.4 Low NR band 4Rx for handheld UE and 3Tx for inter-band UL CA and EN-DC

### 5.5 NR Support for UAV

### 5.6 Enhanced LTE Support for UAV

### 5.7 Support of intra-band non-collocated EN-DC/NR-CA deployment

### 5.8 Air-to-ground network for NR

#### 5.8.1 UE RF requirements

#### 5.8.2 BS RF requirements and conformance testing

**R4-2411073 Discussion on the remaining issues for ATG enhancement BS RF**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411074 Draft CR for 38.104: Introduction of R19 ATG enhancement BS RF requirements**

*Type: draftCR For: Endorsement  
 38.104 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: CATT*

**Decision: Not pursued**

**R4-2411075 Draft CR for 38.141-1: Introduction of R19 ATG enhancement BS RF requirements**

*Type: draftCR For: Endorsement  
 38.141-1 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: CATT*

**Decision: Not pursued**

**R4-2411076 Draft CR for 38.141-2: Introduction of R19 ATG enhancement BS RF requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: CATT*

**Decision: Not pursued**

#### 5.8.3 RRM core and performance requirements

#### 5.8.4 Demodulation performance requirements

**R4-2411754 (NR\_ATG-Perf) Discussion on k1 value and range correction for ATG**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2411755 (NR\_ATG-Perf) CR to TS 38.101-4 corrections of PDSCH and corresponding HARQ-ACK relationship for 30D4S6U TDD pattern for ATG**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0586 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2413578 (from R4-2411755)**

**R4-2413578 (NR\_ATG-Perf) CR to TS 38.101-4 corrections of PDSCH and corresponding HARQ-ACK relationship for 30D4S6U TDD pattern for ATG**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0586 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2413604 (from R4-2413578)**

**R4-2413604 (NR\_ATG-Perf) CR to TS 38.101-4 corrections of PDSCH and corresponding HARQ-ACK relationship for 30D4S6U TDD pattern for ATG**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0586 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: Agreed**

ZTE: This is a big change, we cannot agree.

Ericsson: We previously had a similar concern with ZTE, but we are now fine with it after further discussion. ATG BS and UE will be specifically designed. This is only for the RAN4 test.

CMCC: Same understanding as Ericsson. BS and UE are customized for this application.

ZTE: We agree option 1 is workable, but results in big changes in the system design. During conformance testing, we should not be discussing change to core specification.

CMCC: The HARQ process is not supported by current product. We need to solve this problem.

Ericsson: We don’t currently have an official way to map K1 value. We need a workable way as described in this CR. We can first agree with this CR, but if we find another alternative way, we can submit another CR in the future.

ZTE: Our preference is option 2 for RAN1 update, but since the WID does not include RAN1 this is not possible.

CMCC: This is from the last meeting. We have agreed this solution at the last meeting and this meeting and we have not found any solution. How can we postpone to next meeting?

ZTE: We can drop this TDD configuration. 30D4S6U

CMCC: We do not agree to drop this TDD configuration. A lot of work has been done since Rel-17 from RAN1.

Nokia: The legacy TDD pattern is possible, but throughput is suboptimal.

CMCC: This is tied to a UE capability. If UE supports this capability, then the test case is applicable. If UE does not support this capability, we can consider other solutions. We are open to further study. We may have a solution for the UE that doesn’t support this capability, but we haven’t had a chance to fully verify it yet.

CMCC: Our proposal: If UE supports this capability, then the test case is applicable according to this CR. If UE does not support this capability, we can consider other solutions.

Chair: Companies to consider the proposal from CMCC for return-to tomorrow. Revised to 3578 to introduce applicability aspect.

Qualcomm: We have a proposal to cover UE’s that do not support out-of-order capability.

CMCC: It is premature to reach a conclusion since this proposal was just presented today. We should focus first on the UE that does support out-of-order today and defer until next meeting for the UE that does not support the capability.

Qualcomm: This capability is not in the applicability rules so we would be changing the scope of the requirement. We cannot agree.

Huawei: The capability was introduced from Rel-16, but the ATG feature is Rel-18. A Rel-18 UE should be able to support a Rel-16 UE. We don’t understand Qualcomm’s concern about a new feature.

Qualcomm: It is an optional capability, the release in which it was introduced is irrelevant.

Ericsson: We understand Qualcomm’s concern, but the problem is the UE with the current capabilities cannot be tested for the TDD pattern. Thus, we need a new capability.

Huawei: Qualcomm’s concern is the CR only introduces a requirement for the UE that supports out-of-order HARQ ACK, but leaves no requirement for the UE that does not support. The requirements for those UE’s can be considered next meeting.

ZTE: We still have concern on the complexity of the proposal in this CR. May require additional effort on both BS and UE side.

CMCC: It is very important to have a test case. This TDD pattern was presented at the beginning of the work item. This TDD pattern is also used in the field test. It is important to approve the CR in this meeting.

Qualcomm: We are concerned that this CR changes the scope of the requirement and leaves a placeholder for new requirements in maintenance. If there are no other companies objecting, we can accept it.

ZTE: Ok

**R4-2412150 CR to 38.101-4: Correction on PDSCH demodulation requirement for ATG**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0590 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR adds the missing test case number, and corrects some typo in the FRC tables

**Decision: Agreed**

**R4-2412314 (NR\_ATG-Perf) CR for 38.141-1 Correction on refering index for ATG requirements**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0462 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Corrections on refering index

**Decision: Agreed**

**R4-2412315 (NR\_ATG-Perf) CR for 38.141-2 Adding test torlerance for ATG requirements**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0596 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Adding TT for ATG

**Decision: Agreed**

**R4-2412769 CR on ATG PDSCH demodulation performance requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0615 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413554 (from R4-2412769)**

**R4-2413554 CR on ATG PDSCH demodulation performance requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0615 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

### 5.9 Further RF requirements enhancement for NR and EN-DC in FR1

#### 5.9.1 UE RF requirements

#### 5.9.2 RRM performance requirements

#### 5.9.3 Demodulation and CSI requirements

##### 5.9.3.1 8Rx UE demodulation and CSI

**R4-2411028 CR for TS38.101-4, corrections on UE 8Rx requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0567 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2411042 (NR\_ENDC\_RF\_FR1\_enh2-Perf) 8Rx PDSCH CA Performance Requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0570 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Merged**

**R4-2411179 Correction on the 8Rx CQI reporting requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0571 rev Cat: F (Rel-18)  
  
 Source: China Telecom*

**Decision: Agreed**

**R4-2412145 Simulation results collection for 8 Rx UE demodulation requirement**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This is the simulation result collection for 8Rx PDSCH requirement. MCC: This contribution is summary of simulation results. It is assumed that it will be made available during the meeting.

**Decision: Noted**

**R4-2412148 CR to 38.101-4: Correction on 8Rx PDSCH requirement**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0588 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR Corrects some error in the 8Rx FRC tables

**Decision: Merged**

**R4-2412759 CR for 38.101-4 Corrections on 8Rx requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0614 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413466 (from R4-2412759)**

**R4-2413466 CR for 38.101-4 Corrections on 8Rx requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0614 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2412794 CR on 38.101-4 for 8Rx CA requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0624 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Merged**

**R4-2412873 [NR\_ENDC\_RF\_FR1\_enh2-Perf] CR on applicability rules and demodulation requirements for 8Rx**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0628 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Merged**

**R4-2412874 [NR\_ENDC\_RF\_FR1\_enh2-Perf] CR on demodulation requirements and reference channels for 8Rx CA**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0629 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: A revision is required to due parsing failure. Change request number wrong on CR cover for TDoc R4-2412874. Database value : 0629. CR cover value : 0530. This is a major failure due to wrong CR numbering.

**Decision: Merged**

##### 5.9.3.2 4Tx BS demodulation

**R4-2411043 (NR\_ENDC\_RF\_FR1\_enh2-Perf) 4Tx PUSCH Performance Requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0647 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Merged**

**R4-2412760 CR for 38.104 Corrections on 4Tx requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0656 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision:** The document was **withdrawn**.

**R4-2412761 CR for 38.141-1 Corrections on 4Tx requirements**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0467 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision:** The document was **withdrawn**.

**R4-2412910 CR for 38.104 Corrections on 4Tx requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0657 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413467 (from R4-2412910)**

**R4-2413467 CR for 38.104 Corrections on 4Tx requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0657 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2412911 (NR\_ENDC\_RF\_FR1\_enh2-Perf) CR for 38.141-1 Corrections on 4Tx requirements**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0468 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision:** The document was **withdrawn**.

**R4-2412927 CR for 38.141-1 Corrections on 4Tx requirements**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0469 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

#### 5.9.4 Moderator summary and conclusions

**R4-2413418 Topic summary for [112][318] RF\_FR1\_enh2\_Demod**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[112] BDaT Session AI 5.9.3, 5.9.3.1, 5.9.3.2

**Decision: Noted**

### 5.10 NR RF requirements enhancement for FR2, Phase 3

#### 5.10.1 UE RF requirements

#### 5.10.2 BS demodulation requirements (UL 256QAM)

#### 5.10.3 Moderator summary and conclusions

### 5.11 NR support for dedicated spectrum less than 5MHz for FR1

#### 5.11.1 System parameter and UE RF requirements

#### 5.11.2 BS RF requirements and conformance testing

#### 5.11.3 RRM core and performance requirements

#### 5.11.4 Demodulation performance requirements

**R4-2411667 Simulation results alignment for UE Demod**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

MCC: This contribution is summary of simulation results. It is assumed that it will be made available during the meeting.

**Decision: Withdrawn**

##### 5.11.4.1 UE demodulation performance and CSI requirements

**R4-2412752 CR for 38.101-4 Corrections on less than 5MHz PDCCH demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0610 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413468 (from R4-2412752)**

**R4-2413468 CR for 38.101-4 Corrections on less than 5MHz PDCCH demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0610 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

##### 5.11.4.2 BS demodulation performance requirements

**R4-2411041 (NR\_FR1\_lessthan\_5MHz\_BW-Perf) CR for 38.104, update to PUCCH requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0646 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Revised to R4-2413469 (from R4-2411041)**

**R4-2413469 (NR\_FR1\_lessthan\_5MHz\_BW-Perf) CR for 38.104, update to PUCCH requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0646 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2412318 (NR\_FR1\_lessthan\_5MHz\_BW-Perf) CR for 38.141-1 PUCCH format 2 for 3MHz**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0463 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

remove brackets from SNR value

**Decision: Agreed**

**R4-2413443 CR on performance requirements for PUCCH format 2 for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0601 rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Withdrawn**

**R4-2413532 CR on performance requirements for PUCCH format 2 for TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0602 rev Cat: F (Rel-18)*

*Source: Samsung*

**Abstract:**

**Decision: Agreed**

#### 5.11.5 Moderator summary and conclusions

**R4-2413419 Topic summary for [112][319] NR\_FR1\_lessthan\_5MHz\_BW\_demod**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

[112] BDaT Session AI 5.11.4, 5.11.4.1, 5.11.4.2

**Decision: Noted**

### 5.12 NB-IoT/eMTC core & perf. requirements for NTN

#### 5.12.1 UE RF requirements

#### 5.12.2 SAN RF requirements and conformance testing

#### 5.12.3 RRM core and performance requirements

#### 5.12.4 Demodulation requirements

**R4-2411132 (LTE\_NBIOT\_eMTC\_NTN\_req-Perf)CR for TS36.181, Correction on Number of RX antennas in header row of tables for radiated demodulation test requirements**

*Type: CR For: Agreement  
 36.181 v18.4.0 CR-0021 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2412547 (LTE\_NBIoT\_eMTC\_NTN\_req) Collection of IoT-NTN SAN demodulation performance requirements**

*Type: CR For: Agreement  
 36.108 v18.6.0 CR-0028 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects IoT-NTN SAN demodulation performance requirements.

**Decision: Agreed**

**R4-2412548 (LTE\_NBIoT\_eMTC\_NTN\_req) Collection of IoT-NTN SAN demodulation conformance requirements**

*Type: CR For: Agreement  
 36.181 v18.4.0 CR-0022 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects IoT-NTN SAN demodulation conformance requirements.

**Decision: Agreed**

### 5.13 Requirement for NR FR2 multi-Rx chain DL reception

#### 5.13.1 RRM core requirements

#### 5.13.2 RRM performance requirements

#### 5.13.3 Demodulation performance and CSI requirements

**R4-2411379 CR to 38.101-4 on PDSCH demod requirements for mDCI fully-overlapping with multi-RX in FR2**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0572 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2413555 (from R4-2411379)**

**R4-2413555 CR to 38.101-4 on PDSCH demod requirements for mDCI fully-overlapping with multi-RX in FR2**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0572 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Agreed**

**R4-2411665 CR for 38.101-4 on RMC corrections for MultiRx requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0584 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2413556 CR for 38.101-4 on RMC corrections for MultiRx requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0584 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Withdrawn**

**R4-2413398 CR to TR38.751 Receiver assumption and conclusions for FR2 multi-Rx demodulation evaluations**

*Type: CR For: Agreement  
 38.751 v18.2.0 CR-0007 rev Cat: D (Rel-18)  
  
 Source: QUALCOMM Europe Inc. - Spain*

**Decision: Agreed**

**R4-2413557 CR to TR38.751 Receiver assumption and conclusions for FR2 multi-Rx demodulation evaluations**

*Type: CR For: Agreement  
 38.751 v18.2.0 CR-0007 rev Cat: D (Rel-18)  
  
 Source: QUALCOMM Europe Inc. - Spain*

**Decision: Withdrawn**

#### 5.13.4 Moderator summary and conclusions

### 5.14 Even Further RRM enhancement for NR and MR-DC

#### 5.14.1 RRM core requirements

#### 5.14.2 RRM performance requirements

#### 5.14.3 Moderator summary and conclusions

### 5.15 Further enhancements on NR and MR-DC measurement gaps and measurements without gaps

#### 5.15.1 RRM core requirements

#### 5.15.2 RRM performance requirements

#### 5.15.3 Moderator summary and conclusions

### 5.16 Completion of specification support for bandwidth part operation without restriction in NR

**R4-2411431 Discussion of R18 BWP wor maintenance**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2411432 CR for BWP wor maintenance**

*Type: CR For: Agreement  
 38.133 v18.6.0 CR-4670 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

#### 5.16.1 RRM core and performance requirements

#### 5.16.2 Moderator summary and conclusions

### 5.17 Enhanced NR support for high speed train scenario in frequency range 2

#### 5.17.1 RRM core and performance requirements

#### 5.17.2 Demodulation performance requirements

**R4-2413445 Correction CR for TS 38.101-4 on Rel-18 FR2 HST demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0639 rev Cat: F (Rel-18)  
  
 Source: Samsung>*

**Decision: Revised to R4-2413558 (from R4-2413445)**

**R4-2413558 Correction CR for TS 38.101-4 on Rel-18 FR2 HST demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0639 rev Cat: F (Rel-18)  
  
 Source: Samsung>*

**Decision: Agreed**

#### 5.17.3 Moderator summary and conclusions

### 5.18 Enhancement of Multiple Input Multiple Output Over-the-Air test methodology and requirements for NR UEs

#### 5.18.1 FR2 MIMO OTA test methodology enhancement

**R4-2411136 Autocorrelation Channel Model Speed Correction**

*Type: CR For: Agreement  
 38.151 v17.8.0 CR-0041 rev Cat: F (Rel-17)  
  
 Source: Spirent Communications, CAICT, Keysight Technologies*

**Abstract:**

CDL-C UMi speed for FR2 is 12km/hr as given in TR38.827. TS38.151 specifies a mobile speed of 3km/hr. This inconsistency needs to be corrected.

**Decision: Agreed**

**R4-2411137 Autocorrelation Channel Model Speed Correction**

*Type: CR For: Agreement  
 38.151 v18.1.0 CR-0042 rev Cat: A (Rel-18)  
  
 Source: Spirent Communications, CAICT, Keysight Technologies*

**Abstract:**

CDL-C UMi speed for FR2 is 12km/hr as given in TR38.827. TS38.151 specifies a mobile speed of 3km/hr. This inconsistency needs to be corrected.

**Decision: Agreed**

#### 5.18.2 FR1 MIMO OTA test methodology enhancement

**R4-2411599 CR to TR38.761 R18 adding the lab 5 channel mode validation for Band n1**

*Type: CR For: Agreement  
 38.761 v18.2.1 CR-0011 rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Agreed**

#### 5.18.3 Performance requirements

#### 5.18.4 Moderator summary and conclusions

**R4-2413432 Topic summary for [112][332] NR\_MIMO\_OTA\_enh**

*Type: other For: Information  
 Source: Moderator (CAICT)*

**Abstract:**

[112] BDaT Session AI 5.18.1, 5.18.2, 5.18.3

**Decision: Withdrawn**

### 5.19 NR demodulation performance evolution

#### 5.19.1 General aspects

#### 5.19.2 Advanced receiver to cancel inter-user interference for MU-MIMO demodulation requirements

**R4-2411180 Discussion on test applicability updates for advanced Rec for MU-MIMO**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2411380 CR to 38.101-4 on FDD 4Rx requirements for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0573 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2413479 (from R4-2411380)**

**R4-2413479 CR to 38.101-4 on FDD 4Rx requirements for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0573 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Agreed**

**R4-2411381 Clarification on default assumptions for MU-MIMO with advanced receiver**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2411382 Simulation result collection for MU-MIMO with advanced receiver**

*Type: discussion For: Discussion  
 Source: Apple*

**Abstract:**

MCC: This contribution is collection of simulation results. It is assumed that it will be made available during the meeting.

**Decision: Noted**

**R4-2411661 CR for 38.101-4 on RMC corrections for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0581 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2411664 CR for 38.878 on corrections of description and summary**

*Type: CR For: Agreement  
 38.878 v18.3.0 CR-0005 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2411772 MU-MIMO enhancement simulation results**

*Type: discussion For: Discussion  
 Source: Qualcomm Technologies Ireland*

**Abstract:**

In this contribution, we provide our simulation results.

**Decision: Noted**

**R4-2412147 CR to 38.101-4: Correction on FDD 2Rx PDSCH requirements for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0587 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects some typo and remove square brackets

**Decision: Revised to R4-2413480 (from R4-2412147)**

**R4-2413480 CR to 38.101-4: Correction on FDD 2Rx PDSCH requirements for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0587 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

Abstract:

This CR corrects some typo and remove square brackets

**Decision: Agreed**

**R4-2412327 CR on TDD 4Rx requirements for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0595 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2413481 (from R4-2412327)**

**R4-2413481 CR on TDD 4Rx requirements for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0595 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2412753 CR for 38.101-4 Corrections on applicability rules for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0611 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2413600 (from R4-2412753)**

**R4-2413600 CR for 38.101-4 Corrections on applicability rules for advanced receiver for MU-MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0611 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2412754 Discussions for advanced receiver for MU-MIMO**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412755 Updates on simulation results for MU-MIMO**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

#### 5.19.3 Absolute physical layer throughput requirements with link adaptation

#### 5.19.4 Moderator summary and conclusions

**R4-2413420 Topic summary for [112][320] NR\_demod\_enh3\_Part1**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

[112] BDaT Session AI 5.19.1, 5.19.2, 5.19.3

**Decision: Noted**

**Issue 1: Proposed updates to the test applicability rule**

Huawei: Option 1 is more clear

Samsung: Prefer option 2 as it is easier to read

Nokia: We also prefer option 2. We don’t see a reason to complicate.

Apple: Same view as Samsung and Nokia.

Huawei: Option 1 has a 1:1 mapping, so is more readable. There is no capability definition in Option 2.

**Issue 2: Potential extension of RAN4 default assumption on co-UE precoding granularity**

Nokia: Cannot agree to the proposal as-is. Adding the current proposal imposes restrictions on network scheduling. We need further consideration.

Huawei: Wideband precoding is never used in MU-MIMO scheduling. We don’t need the RRC signaling.

Qualcomm: Similar understanding as Huawei. Wideband was intentionally excluded previously. We cannot accept wideband precoding at this time.

MediaTek: Same view as Huawei and Qualcomm.

Apple: RAN1 spec does not preclude MU-MIMO with wideband precoding. If we can clarify from RAN1 that it is precluded, that would also be fine for us. Otherwise, the behavior is unspecified.

Ericsson: If we add this to previous RRC signaling, what should we expect from UE behavior? Even with this correction, there may not be any different UE behavior. Then we don’t see the need for a change to the RRC signaling.

Qualcomm: Agree with comment from Apple regarding RAN1 not precluding. But in practice, we don’t expect to see in deployment with wideband precoding in MU-MIMO. If it needs to be considered, this cannot be done in maintenance.

CTC: Agree with Apple’s motivation. RAN4 is responsible for all possible configurations in the spec, not only the most commonly deployed configurations.

Apple: What should the UE assume if configured for wideband. There is no default assumption, so the overall performance may be degraded. We only want to clarify the default assumption, UE behavior, network behavior. We are not seeking new requirements.

Nokia: The degradation is not expected to be large since only the edge RB’s are impacted.

**R4-2413601 Way Forward on extension of RAN4 default assumption for MU-MIMO advanced receiver**

*Type: For: Approval  
   
 Source: Apple*

**Abstract:**

**Decision: Noted**

Qualcomm: We do not agree to this WF. We acknowledge a hole in the specification in case the scheduler schedules wideband precoding for MU-MIMO. However, there is no indication this happens in the field. We prefer for infra-vendors in indicate this is a problem in the field and then fix it at that time.

Nokia: Although there may have been an implicit assumption, it is not prohibitied. We would like to check with our implementation.

CTC: Can we also consider another option whereby we don’t change the spec but to check with infra-vendors whether wideband precoding is excluded or not.

Nokia: Since we are already in maintenance for this WI, we tend to agree with QC not to have this WF.

Apple: Infravendors are encouraged to bring inputs to the next meeting on whether wideband precoding with MU-MIMO should be considered for advanced receiver.

Nokia: We agree with Apple’s comment.

### 5.20 Multi-carrier enhancements for NR

#### 5.20.1 UE RF requirements

#### 5.20.2 RRM core and performance requirements

#### 5.20.3 Moderator summary and conclusions

### 5.21 Further NR coverage enhancements

#### 5.21.1 UE RF requirements

#### 5.21.2 BS demodulation performance requirements

**R4-2411181 Summary of simulation results for Rel-18 NR coverage enhancements BS demodulation requirements**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Abstract:**

MCC: This contribution is summary of simulation results. It is assumed that it will be made available during the meeting.

**Decision: Noted**

**R4-2411257 Correction on test applicability for PRACH repetition requirements**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0593 rev Cat: F (Rel-18)  
  
 Source: China Telecom*

**Decision: Agreed**

Samsung: Should this be a Cat B CR since we are adding a new section?

Huawei: Cat F can be ok

**R4-2412316 Simulation results for NR PRACH repetition requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results

**Decision: Noted**

**R4-2412317 (NR\_cov\_enh2-Perf ) CR for 38.104 Adding PRACH repetition requirement values**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0652 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Update SNR values

**Decision: Revised to R4-2413482 (from R4-2412317)**

**R4-2413482 (NR\_cov\_enh2-Perf ) CR for 38.104 Adding PRACH repetition requirement values**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0652 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

Abstract:

Update SNR values

**Decision: Agreed**

**R4-2412770 Simulation results on BS demodulation requirements for further coverage enhancements**

*Type: other For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412789 Simulation results for multiple PRACH**

*Type: other For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2413441 Simulation results for further coverage enhancement**

*Type: other For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2413442 CR on test requirements for multiple PRACH transmission in TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0600 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Revised to R4-2413483 (from R4-2413442)**

**R4-2413483 CR on test requirements for multiple PRACH transmission in TS 38.141-2**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0600 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Agreed**

#### 5.21.3 Moderator summary and conclusions

**R4-2413422 Topic summary for [112][322] NR\_cov\_enh2\_demod**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

[112] BDaT Session AI 5.21.2

**Decision: Noted**

### 5.22 NR sidelink evolution

#### 5.22.1 UE RF requirements

#### 5.22.2 RRM core and performance requirements

**R4-2413385 (NR\_SL\_enh2-Core) CR 38.133 Clarification on V2X and SL bands**

*Type: CR For: Agreement  
 38.133 v18.6.0 CR-4946 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

CR 38.133 Clarification on V2X and SL bands

**Decision:** The document was **not treated**.

#### 5.22.3 UE demodulation performance requirements

**R4-2412756 CR for 38.101-4 Corrections on Rel-18 sidelink demod test**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0612 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

#### 5.22.4 Moderator summary and conclusions

### 5.23 NR NTN enhancement

#### 5.23.1 System parameters and regulatory requirements

#### 5.23.2 Co-existence study for above 10GHz bands

**R4-2413356 Maintenance CR for Ka-band coexistence results to TR 38.863**

*Type: CR For: Agreement  
 38.863 v18.2.0 CR-0019 rev Cat: B (Rel-18)  
  
 Source: THALES*

**Abstract:**

The TSG-RAN WG4 Meeting#111 did not incorporate all coexistence results reported by all companies. Therefore, this CR updates coexistence results for Section 6a (co-existence simulations for 17/27 GHz) and corrects some typos. Final results are unchanged.

**Decision:** The document was **withdrawn**.

**R4-2413460 Maintenance CR for Ka-band coexistence results to TR 38.863**

*Type: CR For: Agreement  
 38.863 v18.2.0 CR-0020 rev Cat: F (Rel-18)  
  
 Source: THALES*

**Abstract:**

The TSG-RAN WG4 Meeting#111 did not incorporate all coexistence results reported by all companies. Therefore, this CR updates coexistence results for Section 6a (co-existence simulations for 17/27 GHz) and corrects some typos. Final results remain unchanged.

**Decision: Revised to R4-2413494 (from R4-2413460)**

**R4-2413494 Maintenance CR for Ka-band coexistence results to TR 38.863**

*Type: CR For: Agreement  
 38.863 v18.2.0 CR-0020 rev Cat: F (Rel-18)  
  
 Source: THALES*

Abstract:

The TSG-RAN WG4 Meeting#111 did not incorporate all coexistence results reported by all companies. Therefore, this CR updates coexistence results for Section 6a (co-existence simulations for 17/27 GHz) and corrects some typos. Final results remain unchanged.

**Decision: Agreed**

Qualcomm: It was agreed that TN network ACLR/ACS for 17 GHz should not be captured in the TR. There is a list of methods to alleviate interference, but they are only observations from a single company.

Ericsson: Same comment as Qualcomm

Thales: Intention is the capture the information. We can mention that these values are only used for simulation assumptions. The observations are mainly based on discussion last time, but this is a TR, the output of a study. It would be useful for the reader to have context. We can reword it.

#### 5.23.3 SAN RF requirements

**R4-2411133 (NR\_NTN\_enh-Core)CR for TS 38.108, Correction on general SAN transmitter spurious emission limits for SAN type 2-O**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0080 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2412302 CR for 38.108 on RF FR2-NTN FRC alignments**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0087 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

replace "FR2" by "FR2-NTN" in all sections

**Decision: Agreed**

**R4-2412303 (NR\_NTN\_enh-Core) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0039 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

replace "FR2" by "FR2-NTN" in all sections

**Decision: Agreed**

#### 5.23.4 SAN RF conformance testing requirements

**R4-2411134 (NR\_NTN\_enh-Perf)CR for TS 38.181, Correction on general SAN transmitter spurious emission limits for SAN type 2-O**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0034 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

#### 5.23.5 UE RF requirements

**R4-2411135 (NR\_NTN\_enh-Core)CR for TS 38.101-5, Correction on ACS requirment for mobile VSAT and fixed VSAT**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0101 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411185 (NR\_NTN\_enh-Core) CR to TS 38.101-5: clarification of the additional requirements for n512 + additional fixes**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0103 rev Cat: F (Rel-18)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

This CR clarifies the additional requirements for band n512, remove [] and fix some editorial issues

**Decision: Agreed**

**R4-2412046 CR on log formula for FR2-NTN UE RF requirement**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0107 rev Cat: F (Rel-18)  
  
 Source: LG Electronics*

**Abstract:**

It is CR on log formula for FR2-NTN UE RF requirement

**Decision: Agreed**

**R4-2412480 (NR\_NTN\_enh-Core) CR to correct the definition of cross-polarized transmission - TS38.101-5**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0111 rev Cat: F (Rel-18)  
  
 Source: Anritsu Limited*

**Decision: Agreed**

**R4-2412716 Maintenance CR for NTN VSAT in Ka-band**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0112 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2413491 (from R4-2412716)**

**R4-2413491 Maintenance CR for NTN VSAT in Ka-band**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0112 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

Thales: If TN is operating adjacent and the TN network is TDD, then we need the appropriate OCNG. For Ka band, the interfering TN will always be TDD, so we prefer a TDD pattern.

Ericsson: There is overlap with an Ericsson CR. We suggest to merge them.

Huawei: OCNG is for white noise, not interference. We aren’t sure how to apply this especially for refsens.

**R4-2412948 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to clarify the applicability for different requirements (R18)**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0114 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **withdrawn**.

**R4-2412949 (NR\_NTN\_enh-Core) Discussion on potential solution on Doppler shift issues for guard band and transmission bandwidth configuration**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412950 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to clarify Doppler shift issues for guard band and transmission bandwidth configuration**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0115 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Not pursued**

**R4-2412951 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to modify the mistakes for Tx requirements (R18)**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0116 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413492 (from R4-2412951)**

**R4-2413492 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to modify the mistakes for Tx requirements (R18)**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0116 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

Thales: Change from -30 dBm to -36 dBm/MHz is a big change. This needs further discussion.

Huawei: Current power off requirement reuses BS requirement, this is where the -36 dBm/MHz comes from

Thales: We also have a concern with introducing new capabilities in the RAN4 specifications.

Huawei: We can revise

**R4-2412952 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to modify the mistakes for Rx requirements (R18)**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0117 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413493 (from R4-2412952)**

**R4-2413493 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to modify the mistakes for Rx requirements (R18)**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0117 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2413033 (NR\_NTN\_enh-Core) CR for TS 38.101-5 to clarify the applicability for different requirements (R18)**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0119 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon, Ericsson*

**Decision: Agreed**

#### 5.23.6 RRM core requirements

#### 5.23.7 RRM performance requirements

#### 5.23.8 Demodulation performance requirements

**R4-2413566 Simulation results summary on demodulation requirements for NR NTN enhancements**

*Type: For: Approval  
   
 Source: Huawei*

**Abstract:**

**Decision: Noted**

##### 5.23.8.1 SAN demodulation performance requirements

**R4-2411037 NTN simulation results for DMRS bundling and PUCCH**

*Type: other For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2411038 (NR\_NTN\_enh-Perf) CR on PUCCH performance requirements for 38.108**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0078 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Revised to R4-2413472 (from R4-2411038)**

**R4-2413472 (NR\_NTN\_enh-Perf) CR on PUCCH performance requirements for 38.108**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0078 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2411039 (NR\_NTN\_enh-Perf) CR on PUSCH demodulation requirements for 38.181**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0032 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Revised to R4-2413473 (from R4-2411039)**

**R4-2413473 (NR\_NTN\_enh-Perf) CR on PUSCH demodulation requirements for 38.181**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0032 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2412304 Discussion on manufactory declaration and applicabiity rule for PUSCH DM-RS bundling**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The manufactory declaration and applicability rule

**Decision: Noted**

**R4-2412305 (NR\_NTN\_enh-Perf) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0040 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Adding manufactory declaration and applicability rule

**Decision: Revised to R4-2413474 (from R4-2412305)**

**R4-2413474 (NR\_NTN\_enh-Perf) CR to 38.181 correction on FRC and naming alignment**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0040 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

Abstract:

Adding manufactory declaration and applicability rule

**Decision: Agreed**

**R4-2412306 Simulation results for NR NTN enhancement demodulation**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results

**Decision:** The document was **withdrawn**.

**R4-2412773 CR on NTN radiated performance requirements for PUSCH**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0089 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413475 (from R4-2412773)**

**R4-2413475 CR on NTN radiated performance requirements for PUSCH**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0089 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2412774 CR on NTN OTA performance requirements for PUCCH**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0042 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2413476 (from R4-2412774)**

**R4-2413476 CR on NTN OTA performance requirements for PUCCH**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0042 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2413438 Discussion and simulation results for NTN enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2413439 CR on performance requirements for PUSCH with DM-RS bundling**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0090 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Revised to R4-2413477 (from R4-2413439)**

**R4-2413477 CR on performance requirements for PUSCH with DM-RS bundling**

*Type: CR For: Agreement  
 38.108 v18.3.0 CR-0090 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Agreed**

**R4-2413440 CR on performance requirements for PUSCH in TS 38181**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0043 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Revised to R4-2413478 (from R4-2413440)**

**R4-2413478 CR on performance requirements for PUSCH in TS 38181**

*Type: CR For: Agreement  
 38.181 v18.2.0 CR-0043 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Agreed**

##### 5.23.8.2 UE demodulation performance and CSI requirements

**R4-2411040 (NR\_NTN\_enh-Perf) CR on performance requirements for 38.101-5**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0100 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Revised to R4-2413470 (from R4-2411040)**

**R4-2413470 (NR\_NTN\_enh-Perf) CR on performance requirements for 38.101-5**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0100 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2411383 CR to 38.101-5 on eNTN demod requirements for PDCCH**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0106 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Agreed**

**R4-2412151 CR to 38.101-5: Correction on UE demodulation requirement for NTN FR2**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0108 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects some type and remove the suqare brackets

**Decision: Revised to R4-2413471 (from R4-2412151)**

**R4-2413471 CR to 38.101-5: Correction on UE demodulation requirement for NTN FR2**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0108 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

Abstract:

This CR corrects some type and remove the suqare brackets

**Decision: Agreed**

Huawei: Suggest to remove the PDCCH correction since this overlaps with another CR from Apple

**R4-2412772 CR on NTN PDSCH demodulation requirements**

*Type: CR For: Agreement  
 38.101-5 v18.6.0 CR-0113 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Not pursued**

Apple: The table should be kept because one is for NGSO while the other is for GSO.

#### 5.23.9 Moderator summary and conclusions

**R4-2413402 Topic summary for [112][302] NR\_NTN\_enh\_SAN\_RF**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[112] BDaT Session AI 5.23.3, 5.23.4

**Decision: Noted**

**Issue 1-1-1: SAN type 2-O - spurious limit**

Huawei: Compared to TN BS, we don’t use abbreviation. Cover both single carrier and multi-carrier.

NEC: We support the proposal. Should be based on total power.

CATT: We can discuss offline

**R4-2413403 Topic summary for [112][303] NR\_NTN\_enh\_SysParams\_Coex\_UERF**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

[112] BDaT Session AI 5.23.1, 5.23.2, 5.23.5

**Decision: Noted**

**Issue 1-1: Potential solution on Doppler shift issues**

Qualcomm: Doppler shift is common for NR NTN, IoT NTN, FR1, FR2. It has been addressed in IoT NTN which includes language that operator is expectd to provided a guard band that is at least as large as the maximum expected Doppler shift. We suggest the same approach can be used here and no specific updates needed.

Samsung: From RAN4 perspective, we cannot consider enhanced performance as minimum performance. For Rel-19 NGSO tracking we are looking at demod requirements, but this is for emissions. Tracking doppler shift will be studied for demod but not for this.

Thales: Share Qualcomm view. This is under operator control. We have already finished Rel-18 so should not be continuing to discuss new capabilities. If anything, it should be Rel-19 discussion.

Ericsson: Solution 1 is too restrictive. Solution 2 is not a complete solution.

Huawei: IoT NTN specs says it is up to network implementation, but the risk falls on the UE. The UE doesn’t know the requirement in case of network implementation. The network would need to indicate signaling whether 1 RB shift is needed for out-of-band emissions. Once informed, the UE can then determine whether emissions can be met. Solution 3 is not vey complicated. The conformance test performance without Doppler shift doesn’t reflect actual deployment.

Thales: There are proprietary algorithms available today. It is more efficient to implement on networks side. We are open to further discuss in the future.

Qualcomm: The UE does operate under network command.

Thales: The operator is the entity that is responsible including for the UE.

Huawei: The UE has to be aware of the current requirement. Network needs to indicate signaling to inform the UE of relaxed emission, or other.

**R4-2413421 Topic summary for [112][321] NR\_NTN\_enh\_SAN\_UE\_demod**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[112] BDaT Session AI 5.23.8, 5.23.8.1, 5.23.8.2

**Decision: Noted**

**Issue 1: Manufactory declaration and applicability rule for SAN PUSCH DM-RS bundling requirements**

Samsung: Do we need to include the FDD? NTN only has FDD

Huawei: There is no TDD for NTN. Do we need to consider TDD at all? We are ok to keep the FDD

Huawei: Do not need to mention SCS in the applicability rule

Samsung: We need it for both 15 and 30 kHz

Ericsson: The declaration does not include SCS, so there is inconsistency with the applicability rule. We are ok to add the 15 kHz and 30 kHz SCS in the declaration.

**Issue 2: Requirement derivation**

Samsung: If we remove outliers, then the number of results from companies is too small. We suggest to add margin to derive the requirement under this condition.

Huawei: Additional margin is not the only solution. We can check case-by-case and perhaps relax the span. For DMRS bundling window size, there was already discussion last meeting. We should not revise the test parameters again at this stage.

Nokia: We would not like to see the span above 3.5 dB if we relax it about 2 dB.

Samsung: Relaxing the span could be ok also. We would like to understand where the gap is coming from.

Ericsson: We need to check the simulator to get alignment first before relaxing the requirement. At least for DMRS bundling.

Huawei: We are fine if companies want to check the simulator but we should set a deadline. We need a solution this meeting.

Nokia: Ericsson, Nokia, and Samsung are well aligned. Huawei is a little further apart.

Huawei: We will recheck our simulator. We may be able to provide an update this week.

**R4-2413524 Way Forward for solutions to address Doppler shift issues**

*Type: For: Approval  
   
 Source: Huawai, HiSilicon*

**Abstract:**

**Decision: Approved**

Samsung: We can accept the WF. Any options which involves signaling which impacts RAN2 should not be considered in Rel-18 since ASN.1 has already been frozen.

### 5.24 Further NR mobility enhancements

#### 5.24.1 RRM Core requirements

#### 5.24.2 RRM Performance requirements

#### 5.24.3 Moderator summary and conclusions

### 5.25 Dual Tx/Rx Multi-SIM for NR

#### 5.25.1 RRM core and performance requirements

#### 5.25.2 Moderator summary and conclusions

### 5.26 Enhanced NR Sidelink Relay

#### 5.26.1 RRM core and performance requirements

#### 5.26.2 Moderator summary and conclusions

### 5.27 NR MIMO evolution for downlink and uplink

#### 5.27.1 RRM core requirements

#### 5.27.2 RRM performance requirements

#### 5.27.3 Demodulation performance requirements

##### 5.27.3.1 UE demodulation performance and CSI requirements

**R4-2411388 CR for Applicability of requirements for MIMO Evo**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0574 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Merged**

**R4-2411666 CR for 38.101-4 on PMI req for typeII-CJT-r18 for FR1 FDD**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0585 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Merged**

**R4-2412771 CR on PMI reporting requirements of typeII-doppler-r18 for FR1**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0616 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged**

**R4-2412875 [NR\_MIMO\_evo\_DL\_UL-Perf] CR on applicability rules and demodulation requirements for Rel-18 MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0630 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: A revision is required due to parsing failure. Change request number wrong on CR cover for TDoc R4-2412875. Database value : 0630. CR cover value : 0530. This failure is major as it is the wrong CR numbering.

**Decision: Revised to R4-2413484 (from R4-2412875)**

**R4-2413484 [NR\_MIMO\_evo\_DL\_UL-Perf] CR on applicability rules and demodulation requirements for Rel-18 MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0630 rev Cat: F (Rel-18)  
  
 Source: Samsung*

Abstract:

MCC: A revision is required due to parsing failure. Change request number wrong on CR cover for TDoc R4-2412875. Database value : 0630. CR cover value : 0530. This failure is major as it is the wrong CR numbering.

**Decision: Agreed**

**R4-2412876 [NR\_MIMO\_evo\_DL\_UL-Perf] CR on applicability rules and CSI reporting requirements for Rel-18 MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0631 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: A revision is required due to parsing failure. Change request number wrong on CR cover for TDoc R4-2412876. Database value : 0631. CR cover value : 0530. This failure is major as it is the wrong CR numbering on the CR coversheet.

**Decision: Revised to R4-2413485 (from R4-2412876)**

**R4-2413485 [NR\_MIMO\_evo\_DL\_UL-Perf] CR on applicability rules and CSI reporting requirements for Rel-18 MIMO**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0631 rev Cat: F (Rel-18)  
  
 Source: Samsung*

Abstract:

MCC: A revision is required due to parsing failure. Change request number wrong on CR cover for TDoc R4-2412876. Database value : 0631. CR cover value : 0530. This failure is major as it is the wrong CR numbering on the CR coversheet.

**Decision: Agreed**

##### 5.27.3.2 BS demodulation performance requirements

**R4-2412312 (NR\_MIMO\_evo\_DL\_UL-Perf) CR for 38.141-1 correction on declaration, applicability rule and test torlerance for PUSCH with enhanced DM-RS**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0461 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

correction on declaration, applicability rule and test torlerance for PUSCH with enhanced DM-RS

**Decision: Agreed**

**R4-2412313 (NR\_MIMO\_evo\_DL\_UL-Perf) CR for 38.141-2 correction on test torlerance for PUSCH with enhanced DM-RS**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0595 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Adding test torlerance for PUSCH with enhanced DM-RS

**Decision: Revised to R4-2413592 (from R4-2412313)**

**R4-2413592 (NR\_MIMO\_evo\_DL\_UL-Perf) CR for 38.141-2 correction on test torlerance for PUSCH with enhanced DM-RS**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0595 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

Abstract:

Adding test torlerance for PUSCH with enhanced DM-RS

**Decision: Agreed**

#### 5.27.4 Moderator summary and conclusions

**R4-2413423 Topic summary for [112][323] NR\_MIMO\_evo\_DL\_UL\_demod**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

[112] BDaT Session AI 5.27.3, 5.27.3.1, 5.27.3.2

**Decision: Noted**

### 5.28 Enhanced support of reduced capability NR devices

#### 5.28.1 RRM core requirements

#### 5.28.2 Demodulation performance requirements

##### 5.28.2.1 UE demodulation performance and CSI requirements

**R4-2411394 CR on PDSCH TDD Requirements for Enhanced Support of RedCap**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0576 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Abstract:**

MCC: Moderator stated to move R4-2411394 from AI 8.1.1.3.2 to AI 5.28.2.1 and treat it in [324]

**Decision: Revised to R4-2413486 (from R4-2411394)**

**R4-2413486 CR on PDSCH TDD Requirements for Enhanced Support of RedCap**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0576 rev Cat: F (Rel-18)  
  
 Source: Apple*

Abstract:

MCC: Moderator stated to move R4-2411394 from AI 8.1.1.3.2 to AI 5.28.2.1 and treat it in [324]

**Decision: Agreed**

**R4-2412549 UE demodulation and CSI reporting requirements for RedCap enhancements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution dicsusses open issues on the UE demodulation and CSI reporting requirements for Rel-18 eRedCap.

**Decision: Noted**

**R4-2412550 Summary of simulation results for eRedCap UE demodulation requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This spreadsheet summarizes the simulation results for UE demodulation requirements for eRedCap. MCC: This contribution is summary of simulation results. It is assumed that it will be made available during the meeting.

**Decision: Withdrawn**

**R4-2412551 (NR\_redcap\_enh-Perf) CR for 38.101-4: Correction of eRedCap demodulation and CSI reporting requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0598 rev Cat: F (Rel-18)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

This draft CR provides FDD PDSCH demodulation requirements for eRedCap.

**Decision: Revised to R4-2413487 (from R4-2412551)**

**R4-2413487 (NR\_redcap\_enh-Perf) CR for 38.101-4: Correction of eRedCap demodulation and CSI reporting requirements**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0598 rev Cat: F (Rel-18)  
  
 Source: Ericsson, Huawei, HiSilicon*

Abstract:

This draft CR provides FDD PDSCH demodulation requirements for eRedCap.

**Decision: Agreed**

**R4-2412757 Discussions on remaining issues for eRedCap**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2413311 Simulation results for eRedCap CQI reporting**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2413488 (from R4-2413311)**

**R4-2413488 Simulation results for eRedCap CQI reporting**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted**

##### 5.28.2.2 BS demodulation performance requirements

#### 5.28.3 Moderator summary and conclusions

**R4-2413424 Topic summary for [112][324] NR\_redcap\_enh\_demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[112] BDaT Session AI 5.28.2, 5.28.2.1, 5.28.2.2

**Decision: Noted**

### 5.29 Network energy saving for NR

#### 5.29.1 RRM core requirements

#### 5.29.2 RRM performance requirements

#### 5.29.3 UE demodulation performance and CSI requirements

#### 5.29.4 Moderator summary and conclusions

### 5.30 IoT (Internet of Things) NTN (non-terrestrial network) enhancements

#### 5.30.1 SAN RF requirements

#### 5.30.2 RRM core and performance requirements

#### 5.30.3 Demodulation performance requirements

#### 5.30.4 Moderator summary and conclusions

### 5.31 NR Network-controlled Repeaters

#### 5.31.1 RF core requirements

**R4-2411125 Discussion on network controlled repeater classes**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411126 (NR\_netcon\_repeater-Core)CR for TS 38.106, Correction on network controlled repeater classes for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0085 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413595 (from R4-2411126)**

**R4-2413595 (NR\_netcon\_repeater-Core)CR for TS 38.106, Correction on network controlled repeater classes for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0085 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411129 Discussion on 5MHz channel bandwidth for NCR-MT**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411709 CR to TS 38.106 Correction on requirement set applicability**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0087 rev Cat: F (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Merged**

**R4-2412334 Discussion on ACLR requirements for NCR**

*Type: discussion For: Discussion  
 Source: NEC*

**Decision: Noted**

**R4-2412335 CR to 38.106: ACLR requirements for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0088 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Noted**

**R4-2412336 CR to 38.115-1: ACLR requirements for NCR**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0041 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Noted**

**R4-2412337 CR to 38.115-2: ACLR requirements for NCR**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0021 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Noted**

**R4-2412338 CR to 38.106: Requirement set applicability**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0089 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2413498 (from R4-2412338)**

**R4-2413498 CR to 38.106: Requirement set applicability**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0089 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

##### 5.31.1.1 RF requirements for NCR-Fwd

**R4-2411055 CR for TS 38.106, Correction on antenna connector and TAB connector related symbols for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0084 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413497 (from R4-2411055)**

**R4-2413497 CR for TS 38.106, Correction on antenna connector and TAB connector related symbols for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0084 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2412900 Discussion on alignment for repeater naming terminology in core and test specifications**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

##### 5.31.1.2 RF requirements for NCR-MT

**R4-2411052 Discussion on Requirement set applicability for NCR core spec**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411053 CR for TS 38.106, Correction on Applicability of requirements for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0082 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413495 (from R4-2411053)**

**R4-2413495 CR for TS 38.106, Correction on Applicability of requirements for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0082 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411054 CR for TS 38.106, Correction on general requirements for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0083 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413496 (from R4-2411054)**

**R4-2413496 CR for TS 38.106, Correction on general requirements for NCR**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0083 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411130 (NR\_netcon\_repeater-Core)CR for TS 38.106, Correction on requirement for 5MHz channel bandwidth for NCR MT**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0086 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413599 (from R4-2411130)**

**R4-2413599 (NR\_netcon\_repeater-Core)CR for TS 38.106, Correction on requirement for 5MHz channel bandwidth for NCR MT**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0086 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2412901 CR to TS 38.106 with updates and corrections**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0091 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Postponed**

#### 5.31.2 EMC core requirements

**R4-2412902 CR to TS 38.114 with updates and corrections**

*Type: CR For: Agreement  
 38.114 v18.2.0 CR-0016 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Abstract:**

MCC: The WI code in the database was updated to match the CR coversheet.

**Decision: Revised to R4-2413499 (from R4-2412902)**

**R4-2413499 CR to TS 38.114 with updates and corrections**

*Type: CR For: Agreement  
 38.114 v18.2.0 CR-0016 rev Cat: F (Rel-18)  
  
 Source: Nokia*

Abstract:

MCC: The WI code in the database was updated to match the CR coversheet.

**Decision: Agreed**

#### 5.31.3 RF conformance testing

**R4-2411056 Maintenance CR to TS 38.115-1: NCR conformance part**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0035 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413505 (from R4-2411056)**

**R4-2413505 Maintenance CR to TS 38.115-1: NCR conformance part**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0035 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411057 Maintenance CR to TS 38.115-2: NCR conformance part**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0018 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Merged**

**R4-2411127 (NR\_netcon\_repeater-Perf)CR for TS 38.115-1, Correction on network controlled repeater classes for NCR**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0036 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413596 (from R4-2411127)**

**R4-2413596 (NR\_netcon\_repeater-Perf)CR for TS 38.115-1, Correction on network controlled repeater classes for NCR**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0036 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411128 (NR\_netcon\_repeater-Perf)CR for TS 38.115-2, Correction on network controlled repeater classes for NCR**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0019 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413597 (from R4-2411128)**

**R4-2413597 (NR\_netcon\_repeater-Perf)CR for TS 38.115-2, Correction on network controlled repeater classes for NCR**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0019 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411131 (NR\_netcon\_repeater-Perf)CR for TS 38.115-1, Correction on requirement for 5MHz channel bandwidth for NCR MT**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0037 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2413598 (from R4-2411131)**

**R4-2413598 (NR\_netcon\_repeater-Perf)CR for TS 38.115-1, Correction on requirement for 5MHz channel bandwidth for NCR MT**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0037 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2411712 CR to TS 38.115-1: Correction on Scope**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0038 rev Cat: F (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Merged**

**R4-2411713 CR to TS 38.115-2 Correction to introduce NCR type 1-H in part2**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0020 rev Cat: F (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Merged**

**R4-2411714 CR to TS 38.115-1 Editorial Correction on Clause number of Unwanted emissions**

*Type: CR For: Agreement  
 38.115-1 v17.5.0 CR-0039 rev Cat: D (Rel-17)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Noted**

**R4-2411715 CR to TS 38.115-1 Editorial Correction on Clause number of Unwanted emissions**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0040 rev Cat: A (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Withdrawn**

**R4-2412339 CR to 38.115-1: Clause title corrections**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0042 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Merged**

**R4-2412340 CR to 38.115-2: Clause title corrections**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0022 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Merged**

**R4-2412714 Maintenance CR of NCR to TS 38.115-1**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0043 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Merged**

**R4-2412715 Maintenance CR of NCR to TS 38.115-2**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0023 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2413506 (from R4-2412715)**

**R4-2413506 Maintenance CR of NCR to TS 38.115-2**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0023 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2412903 CR to TS 38.115-1 with updates and corrections**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0045 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Revised to R4-2413500 (from R4-2412903)**

**R4-2413500 CR to TS 38.115-1 with updates and corrections**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0045 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2412904 CR to TS 38.115-2 with updates and corrections**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0025 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Revised to R4-2413501 (from R4-2412904)**

**R4-2413501 CR to TS 38.115-2 with updates and corrections**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0025 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Agreed**

**R4-2413246 Follow-up on MU/TT handling for OTA measurements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide a follow-up discussion on the MU/TT values for OTA conformance testing of NCR.

**Decision: Noted**

**R4-2413254 NCR type 2-O testing: MT requirements testing restrictions**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0026 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Based on related discussion paper, in this CR we reflect testing limitations as captured in TS 38.521-2, which were referred in TS 38.115-2 specification for the purpose of MT-specific test of NCR type 2-O (LA class).

**Decision: Revised to R4-2413503 (from R4-2413254)**

**R4-2413503 NCR type 2-O testing: MT requirements testing restrictions**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0026 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

Abstract:

Based on related discussion paper, in this CR we reflect testing limitations as captured in TS 38.521-2, which were referred in TS 38.115-2 specification for the purpose of MT-specific test of NCR type 2-O (LA class).

**Decision: Agreed**

**R4-2413255 Draft LS on reuse of FR2 UE conformance test requirements for NCR testing purposes**

*Type: LS out For: Approval  
 to RAN5  
 Source: Huawei, HiSilicon*

**Abstract:**

RAN WG4 respectfully asks RAN WG5 to inform RAN4 in case open issues or testability issues of OTA maximum input level, OTA ACS and OTA blocking would be updated or resolved.

**Decision: Revised to R4-2413504 (from R4-2413255)**

**R4-2413504 Draft LS on reuse of FR2 UE conformance test requirements for NCR testing purposes**

*Type: LS out For: Approval  
 to RAN5  
 Source: Huawei, HiSilicon*

Abstract:

RAN WG4 respectfully asks RAN WG5 to inform RAN4 in case open issues or testability issues of OTA maximum input level, OTA ACS and OTA blocking would be updated or resolved.

**Decision: Approved**

#### 5.31.4 EMC conformance testing

#### 5.31.5 RRM core and performance requirements

#### 5.31.6 Demodulation performance requirements

**R4-2412795 CR on 38.106 for NCR requirements**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0090 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Revised to R4-2413559 (from R4-2412795)**

**R4-2413559 CR on 38.106 for NCR requirements**

*Type: CR For: Agreement  
 38.106 v18.5.0 CR-0090 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Agreed**

**R4-2412796 CR on 38.115-1 for NCR conformance testing**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0044 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Revised to R4-2413561 (from R4-2412796)**

**R4-2413561 CR on 38.115-1 for NCR conformance testing**

*Type: CR For: Agreement  
 38.115-1 v18.5.0 CR-0044 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Agreed**

**R4-2412797 CR on 38.115-2 for NCR conformance testing**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0024 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Revised to R4-2413560 (from R4-2412797)**

**R4-2413560 CR on 38.115-2 for NCR conformance testing**

*Type: CR For: Agreement  
 38.115-2 v18.1.0 CR-0024 rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Agreed**

#### 5.31.7 Moderator summary and conclusions

**R4-2413404 Topic summary for [112][304] NR\_netcon\_repeater\_RF**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

[112] BDaT Session AI 5.31.1, 5.31.1.1, 5.31.1.2, 5.31.2, 5.31.3, 5.31.4

**Decision: Noted**

**Issue 1-1: NCR Class**

ZTE: The current class definition is clear.

CATT: The manufacturer declaraions are separate

ZTE: Can merge declarations together, including both MT and Fwd

**Issue 1-2: SA Requirements for ACS, IBB and Rx IMD**

ZTE: A clear and simple way is to specify the requirements by reference. For WA BS and NCR-MT, the power levels are nearly the same.

CATT: The FRC’s are different, so cannot reuse.

ZTE: The ACS requirement doesn’t mention FRC.

**Issue 1-3: ACLR requirement for NCR**

NEC: The problem is we would not have an ACLR requirement if the bandwidth does not match

ZTE: We discussed this note last meeting.

CATT: Agree with ZTE

**Issue 1-4: Terminology for NCR**

ZTE: We are ok with Nokia’s proposal

CATT: Modify NR to Rel-18=7

**R4-2413502 Way Forward for [112][304] NR\_netcon\_repeater\_RF**

*Type: For: Approval  
   
 Source: CATT*

**Abstract:**

**Decision: Approved**

### 5.32 Mobile IAB (Integrated Access and Backhaul) for NR

#### 5.32.1 RF core requirements

#### 5.32.2 RF conformance testing

#### 5.32.3 RRM core and performance requirements

#### 5.32.4 Demodulation performance requirements

**R4-2412146 (NR\_IAB-Perf) On the reference channel for CQI reporting requirement for mobile IAB**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses how to address the FRC issue for mobile IAB requirement

**Decision: Noted**

**R4-2412152 CR to 38.174: Correction on mIAB-MT requirement**

*Type: CR For: Agreement  
 38.174 v18.5.0 CR-0115 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR is to clean up the mobile IAB part in the spec.

**Decision: Agreed**

**R4-2412153 CR to 38.176-1: Correction on mIAB-MT requirement**

*Type: CR For: Agreement  
 38.176-1 v18.5.0 CR-0056 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR is to clean up the mobile IAB part in the spec.

**Decision: Agreed**

**R4-2412154 CR to 38.176-2: Correction on mIAB-MT radiated requirement**

*Type: CR For: Agreement  
 38.176-2 v18.5.0 CR-0059 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR is to clean up the mobile IAB part in the spec.

**Decision: Agreed**

#### 5.32.5 Moderator summary and conclusions

**R4-2413425 Topic summary for [112][325] NR\_mobile\_IAB\_demod**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[112] BDaT Session AI 5.32.4

**Decision: Noted**

### 5.33 Enhancement of NR dynamic spectrum sharing

#### 5.33.1 UE demodulation performance requirements

**R4-2411389 CR for PDCCH requirements for eDSS - TDD with 2RX**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0575 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Merged**

MTK: We prefer not to change centre to center as there are other parts in the spec that would also need to be changed and perhaps RAN5 specs as well.

**R4-2412149 CR to 38.101-4: Correction on PDCCH demodulation requirement for DSS enhancement**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0589 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR adds some necessary parameter and remove square brackets

**Decision: Revised to R4-2413489 (from R4-2412149)**

**R4-2413489 CR to 38.101-4: Correction on PDCCH demodulation requirement for DSS enhancement**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0589 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

Abstract:

This CR adds some necessary parameter and remove square brackets

**Decision: Agreed**

**R4-2412758 CR for 38.101-4 Corrections on test setup for eDSS tests**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0613 rev Cat: F (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Merged**

**R4-2412906 CR on eDSS PDCCH FDD 4Rx**

*Type: CR For: Agreement  
 38.101-4 v18.4.0 CR-0632 rev Cat: F (Rel-18)  
  
 Source: Nokia*

**Decision: Merged**

#### 5.33.2 Moderator summary and conclusions

**R4-2413426 Topic summary for [112][326] NR\_DSS\_enh**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[112] BDaT Session AI 5.33.1

**Decision: Noted**

### 5.34 Other Rel-18 non-spectrum related WIs

#### 5.34.1 UE RF requirements

#### 5.34.2 BS RF requirements

#### 5.34.3 RRM requirements

#### 5.34.4 Demodulation performance and CSI requirements

[MCC]: For TEI18 CAT B authors, please take a look at the guideline of TEI part from RAN4#112 meeting arrangements and guidelines document in reference to the TEI identifier needing to be present in the title of CR. If authors need assistance, please contact the Chair.

**R4-2412307 (TEI18) Discussion on PRACH format 1 demodulation requirement for HAPS**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The necessary of introduce requirements for PRACH format 1. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317]

**Decision: Noted**

Ericsson: The conclusion is to define a requirement for PRACH format 1 for HAPS with AWGN channel model without frequency offset. According to the simulation results it is confirmed there is negligible performance difference between AWGN with 200 Hz and without frequency offset. Therefore we concluded AWGN without frequency offset can confirm the performance of PRACH reception with HAPS operation considering 100 km range.

Huawei: We agree with the conclusion from Ericsson

Samsung: We are also ok with the conclusion from Ericsson.

DCM: We are also ok.

Moderator: There are CR’s that have been revised to reflect the above conclusion.

**R4-2412308 (TEI18) Simulation results on PRACH format 1 demodulation requirement for HAPS**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317]

**Decision: Noted**

**R4-2412309 (TEI18) CR for 38.104 adding PRACH format 1 demodulation requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0651 rev Cat: B (Rel-18)  
  
 Source: Ericsson, NTT DOCOMO*

**Abstract:**

Adding PRACH format 1 requirement. [MCC]: Missing TEI identifier on the CR coversheet. CAT B CR TEI18. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317].

**Decision: Revised to R4-2413562 (from R4-2412309)**

**R4-2413562 (TEI18) CR for 38.104 adding PRACH format 1 demodulation requirements**

*Type: CR For: Agreement  
 38.104 v18.6.0 CR-0651 rev Cat: B (Rel-18)  
  
 Source: Ericsson, NTT DOCOMO*

Abstract:

Adding PRACH format 1 requirement. [MCC]: Missing TEI identifier on the CR coversheet. CAT B CR TEI18. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317].

**Decision: Agreed**

Huawei: LTE PRACH format 3 is only defined for AWGN. This adds Doppler, so new simulations are needed. If companies are ok to define requirements, the best way could be to add LTE PRACH format 3 for AWGN only without Doppler offset.

Samsung: Based on operator request, so we are ok to define the requirement. But this is for TEI which needs to be completed in 1 quarter. We can reuse LTE requirement to complete in this meeting. But if we need simulation, we would not be able to finish. So, we agree with Huawei’s proposal to reuse LTE requirement w/o Doppler.

Nokia: There is a proposal at RAN to have a HAPS work item for Rel-19, so we should not use TEI18 if this WI is forthcoming. We should not introduce a requirement in the absence of simulation results. We wouldn’t have checked any requirements. We could come back next quarter. We cannot agree to the CR’s in the current form especially the test specs. We need a new manufacturer declaration. We cannot simply copy the LTE requirement.

NTT DoCoMo: We would like to discuss offline. We would prefer not to treat this in a potential Rel-19 work item. We do not intend to propose a Rel-19 work item on HAPS.

Nokia: We could agree as long as requirements are optional and manufacturer declearations are in a new section.

**R4-2412310 CR for 38.141-1 on PRACH format 1 demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0460 rev Cat: B (Rel-18)  
  
 Source: Ericsson, NTT DOCOMO*

**Abstract:**

Adding PRACH format 1 requirement. [MCC]: Missing TEI identifier on the CR coversheet. CAT B CR TEI18. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317].

**Decision: Revised to R4-2413563 (from R4-2412310)**

**R4-2413563 CR for 38.141-1 on PRACH format 1 demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v18.6.0 CR-0460 rev Cat: B (Rel-18)  
  
 Source: Ericsson, NTT DOCOMO*

Abstract:

Adding PRACH format 1 requirement. [MCC]: Missing TEI identifier on the CR coversheet. CAT B CR TEI18. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317].

**Decision: Agreed**

**R4-2412311 (TEI18) CR for 38.141-2 adding PRACH format 1 demodulation requirements**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0594 rev Cat: B (Rel-18)  
  
 Source: Ericsson, NTT DOCOMO*

**Abstract:**

Adding PRACH format 1 requirement. [MCC]: Missing TEI identifier on the CR coversheet. CAT B CR TEI18. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317]

**Decision: Revised to R4-2413564 (from R4-2412311)**

**R4-2413564 (TEI18) CR for 38.141-2 adding PRACH format 1 demodulation requirements**

*Type: CR For: Agreement  
 38.141-2 v18.6.0 CR-0594 rev Cat: B (Rel-18)  
  
 Source: Ericsson, NTT DOCOMO*

Abstract:

Adding PRACH format 1 requirement. [MCC]: Missing TEI identifier on the CR coversheet. CAT B CR TEI18. [MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317]

**Decision: Agreed**

**R4-2412407 (TEI18)Discussion on PRACH demodulation impact of adding TDD bands for HAPS**

*Type: discussion For: Discussion  
 Source: NTT DOCOMO, INC.*

**Abstract:**

[MCC]: Move R4-2412307, R4-2412308, R4-2412309, R4-2412310, R4-2412311, R4-2412407 from AI 5.35 to AI 5.34.4 and treat them in [317].

**Decision: Noted**

#### 5.34.5 OTA aspects

### 5.35 Rel-18 TEI

[MCC]: For TEI18 CAT B authors, please take a look at the guideline of TEI part from RAN4#112 meeting arrangements and guidelines document in reference to the TEI identifier needing to be present in the title of CR. If authors need assistance, please contact the Chair.

**R4-2412784 Discussion on introduction of new FR2 PC**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: Moderator would like to move R4-2412784/3064 from AI 4.8 to AI 5.35 and treat them in [103].

**Decision:** The document was **not treated**.

### 5.36 Rel-18 feature list

## 6 Rel-18 on-going work items

### 6.1 Expanded and improved NR positioning

#### 6.1.1 RRM core requirements maintenance

##### 6.1.1.1 General aspects

##### 6.1.1.2 SL Positioning and Carrier Phase Positioning

##### 6.1.1.3 LPHAP use case

##### 6.1.1.4 RedCap Positioning and PRS/SRS bandwidth aggregation

#### 6.1.2 RRM performance requirements

##### 6.1.2.1 General aspects

##### 6.1.2.2 SL Positioning

##### 6.1.2.3 LPHAP use case

##### 6.1.2.4 RedCap Positioning

##### 6.1.2.5 PRS/SRS bandwidth aggregation

##### 6.1.2.6 Carrier Phase Positioning

#### 6.1.3 Moderator summary and conclusions

### 6.2 Enhancement of TRP and TRS requirements and test methodologies

#### 6.2.1 Enhancement maintenance of test methodology

**R4-2411243 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 38.161 v17.4.0 CR-0011 rev Cat: F (Rel-17)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Decision: Agreed**

**R4-2411244 Clarification of voltage environmental requirement**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0012 rev Cat: A (Rel-18)  
  
 Source: Keysight Technologies UK Ltd, MVG, Rohde & Schwarz, ETS-Lindgren*

**Abstract:**

MCC: This is CAT A CR.

**Decision: Agreed**

**R4-2411699 Measurement results for 3GPP Rel-18 TRP TRS RC lab alignment and harmonization activity - Samsung**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Approved**

**R4-2411700 Discussion on RC lab alignment and RC harmonization with AC**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412049 Final Analysis of 3GPP Rel-18 TRP TRS AC lab alignment and RC harmonization measurement results**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted**

**R4-2412051 CR to TR 38.870 on updating Rel-18 RC harmonization results**

*Type: CR For: Agreement  
 38.870 v18.2.0 CR-0013 rev Cat: F (Rel-18)  
  
 Source: vivo, Samsung*

**Decision: Agreed**

#### 6.2.2 Performance requirements

**R4-2411305 OEM views toward concluding the Rel-18 TRP TRS requirements**

*Type: other For: Approval  
 Source: Apple, vivo, Huawei, HiSilicon, OPPO, Samsung, Xiaomi*

**Decision: Noted**

**R4-2412052 CR to TS 38.161 on alternative RC test method**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0013 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Agreed**

**R4-2412053 CR to TS 38.161 on Rel-18 FR1 TRP TRS requirements**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0014 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2413523 (from R4-2412053)**

**R4-2413523 CR to TS 38.161 on Rel-18 FR1 TRP TRS requirements**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0014 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2413593 (from R4-2413523)**

**R4-2413593 CR to TS 38.161 on Rel-18 FR1 TRP TRS requirements**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0014 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2413594 (from R4-2413593)**

**R4-2413594 CR to TS 38.161 on Rel-18 FR1 TRP TRS requirements**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0014 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2413602 (from R4-2413594)**

**R4-2413602 CR to TS 38.161 on Rel-18 FR1 TRP TRS requirements**

*Type: CR For: Agreement  
 38.161 v18.1.0 CR-0014 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Agreed**

Note: The TRP minimum performance requirements specified in this specification are for global bands with full bandwidth specified by 3GPP. ~~Potential~~ adoption of tighter values by regional standardization bodies is not precluded.

Telecom Italia: The original wording included “expected” that was difficult to agree. We changed this to “is not precluded”

Samsung: “Tighter” is not a fair word to other standards bodies.

Vodafone: The word “tighter” is to justify why 3GPP has more relaxed requirements compared to other regional bodies.

Apple: Support Samsung. ETSI or any other standard body is always able to define their own requirement.

Orange: “Other” could open the door to a more relaxed requirement in other standards bodies.

Vodafone: We can add back “Potential” but prefer to keep “tighter” to soften the sentence

Huawei: Can we change the word to “independent” to indicate other bodies can act independently?

Chair: Can we agree as a compromise to “Adoption of other values by regional standardization bodies is not precluded.”?

Samsung, Huawei, Oppo, Apple, Xiaomi: We can accept the chair’s proposal.

Chair: “Adoption of other values, e.g., improved values, by regional standardization bodies is not precluded.”

Vodafone: 0.4dB higher value will be adopted by the end of Rel-19. We thought the wording should be “in Rel-19”

Apple: The term “full bandwidth” is not defined in 3GPP. We are ok to come back to this next meeting if companies agree.

Orange: We propose instead of “full bandwidth” to use “full frequency range specified by 3GPP”

**R4-2413450 Proposal for FR1 OTA TRP-TRS minimum performance requirements values**

*Type: other For: Approval  
 Source: Telecom Italia S.p.A., Orange, Vodafone, BT plc, Deutsche Telekom, NTT DOCOMO*

**Decision: Noted**

#### 6.2.3 Moderator summary and conclusions

**R4-2413431 Topic summary for [112][331] NR\_FR1\_TRP\_TRS\_enh**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

[112] BDaT Session AI 6.2.1, 6.2.2

**Decision: Noted**

Vodafone: We are introducing new bands and band combinations which impact performance. We plan to show compromise proposal for n41 and by relaxing this, we hope to be able to maintain the requirement on other bands.

Huawei: Can we agree that TT/MU would be left to RAN5?

Vodafone: Our proposal to set TT=0 was a means of reaching a compromise. We may be able to relax the core requirement if the TT can be zero.

Apple: TT is a function of MU. TT is adjustment to core requirement which is spsecified under ideal conditions and reflects realities of test equipment. A lot of work was done in Rel-17 to derive this. We suggest to address TT in RAN5 to push the TE vendors to improve the test equipment MU. TT is proportional to MU.

Samsung: RAN4 should focus on minimum requirement. Testing and TT is the scope of RAN5. Regional specs are not the same as 3GPP since 3GPP defines a global specification.

TIM: TT = 0.6\*MU is a direct proportionality. But in the LS to RAN5, RAN4 suggested not to modify TT even in case MU is modified in RAN5. Then the relationship between TT and MU doesn’t hold any more.

Huawei: Setting TT=0 is infeasible. We don’t believe the MU will change much. We don’t expect MU to go to zero.

Apple: We can move away from the statement freezing the TT relative to MU for Rel-18.

**Issue 1-1-4: How to treat RC harmonization activity for low bands (in Rel-18 or Rel-19**

Samsung: We think Rel-19 is a better way. We expect this would not take much meeting time.

**R4-2413490 Way Forward for [112][331] NR\_FR1\_TRP\_TRS\_enh**

*Type: For: Approval  
   
 Source: vivo*

**Abstract:**

**Decision: Approved**

**R4-2413522 Ad-hoc meeting minutes for [112][331] NR\_FR1\_TRP\_TRS\_enh**

*Type: For: Information  
   
 Source: vivo*

**Abstract:**

**Decision: Noted**

**WI rapporteur proposal for online decision:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Talk mode** | | | | | | | | **Browsing mode** | | | | | | | |
|  | **n1 TRP (PC3)** | **n28 TRP (PC3)** | **n41 TRP (PC2)** | **n78 TRP (PC2)** | **n1 TRS (15 MHz)** | **n28 TRS (20 MHz)** | **n41 TRS (100 MHz)** | **n78 TRS (100 MHz)** | **n1 TRP** | **n28 TRP** | **n41 TRP in spec** | **n78 TRP in spec** | **n1 TRS** | **n28 TRS** | **n41 TRS** | **n78 TRP** |
| **Final value (from WI rapporteur)** | **10.6** | **7.1**  **7.6** | **10** | **11**  **11.5** | **-87** | **-80** | **-79** | **-80** | **11.6** | **10**  **10.5** | ***12.5*** | ***13*** | **-88.5** | **-83.5** | ***-80*** | ***-81.2*** |

Note: The TRP/TRS minimum performance requirements here defined are for global bands with full bandwidth specified by 3GPP. ~~Tighter~~ Other values may be adopted by regional standardization bodies. (WI rapporteur)

Telecom Italia: We are internally checking the values in “OEMs Final compromise”.

Vodafone: Can OEM’s accept the proposal by the moderator?

Samsung: The 7.6 dBm for n28 TRP is borrowed from ETSI LTE spec, but that is based on narrow bandwidth, single duplexer, etc. There are many differences. We are checking internally.

Samsung: 3GPP should not define action items for other standards bodies.

Oppo: Can the second sentence be captured in the TS as editor’s note?

Huawei: Replace “tighter values” with “other values”

Apple: Same view as Huawei

## 7 Rel-19 on-going spectrum related work items for NR and LTE

### 7.1 Moderator summary and conclusions (for AI 6)

**R4-2411592 Big CR on Introduction of completed R19 x(x<=6) DL y(y<=2) UL CA band combinations to TS 36.101**

*Type: CR For: Endorsement  
 36.101 v18.6.0 CR-6053 rev Cat: B (Rel-19)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

MCC: There should not be any Rel-19 CRs for agreement at RAN4#112. This was changed to for "endorsement". This need to be clarified by session Chair that no Rel-19 CRs should be submitted at this stage of Rel-19.

**Decision:** The document was **withdrawn**.

### 7.2 Rel-19 DC of x LTE band(s), y NR band(s) (x<=6) and single or two NR SUL bands

#### 7.2.1 Rapporteur input (WID/TR/big CR)

#### 7.2.2 UE RF requirements for EN-DC and NE-DC of 2 DL with 2 UL (DC\_R19\_1BLTE\_1BNR\_2DL2UL)

#### 7.2.3 UE RF requirements for EN-DC and NE-DC of 2 LTE and 1 NR, or of 1 LTE and 2 NR (DC\_R19\_xBLTE\_yBNR\_3DL2UL)

#### 7.2.4 UE RF requirements for EN-DC and NE-DC of x LTE and y NR with total z DL bands and q UL bands (DC\_R19\_xBLTE\_yBNR\_zDLqUL)

#### 7.2.5 UE RF requirements for EN-DC and NE-DC with one SUL and two SULs (DC\_R19\_LTE\_NR\_SUL\_combos)

### 7.3 Rel-19 NR CA/DC for x bands DL with y bands UL (x<7, y<3) and SUL/CA band combinations with a single SUL or two SUL cells

#### 7.3.1 Rapporteur input (WID/TR/big CR)

#### 7.3.2 UE RF requirements for NR intra-band CA combinations for x CC DL/y CC UL (NR\_CA\_R19\_Intra with/without UL-MIMO)

#### 7.3.3 UE RF requirements for NR inter-band CA/DC configurations including inter band CA for 2 DL with up to 2UL (NR\_CADC\_R19\_2BDL\_xBUL)

#### 7.3.4 UE RF requirements for NR inter-band CA/DC configurations including inter band CA for 3 DL with x UL (NR\_CADC\_R19\_3BDL\_xBUL)

#### 7.3.5 UE RF requirements for NR inter-band CA/DC configurations including inter band CA for y DL with x UL (NR\_CADC\_R19\_yBDL\_xBUL)

#### 7.3.6 UE RF requirements for SUL and CA band combinations with SULs (NR\_SUL\_combos\_R19)

### 7.4 Rel-19 LTE-Advanced Carrier Aggregation for x bands (x<= 6) DL with y bands (y=1, 2) UL

#### 7.4.1 Rapporteur input (WID/TR/big CR)

#### 7.4.2 UE RF requirements

### 7.5 Rel-19 HPUE for NR FR1 TDD/FDD single band

#### 7.5.1 Rapporteur input (WID/TR/big CR)

#### 7.5.2 HPUE in a single TDD band

##### 7.5.2.1 UE RF requirements for PC2 and PC1.5

##### 7.5.2.2 UE RF requirements for PC1 FWVM

#### 7.5.3 HPUE in a single FDD band

##### 7.5.3.1 UE RF requirements for PC2

##### 7.5.3.2 UE RF requirements for PC1 FWVM

### 7.6 Rel-19 HPUE in a single LTE band

#### 7.6.1 Rapporteur input (WID/TR/big CR)

#### 7.6.2 UE RF requirements for PC2

#### 7.6.3 UE RF requirements for PC1 FWVM

### 7.7 Rel-19 HPUE for DC combinations of LTE band(s) and NR band(s)

#### 7.7.1 Rapporteur input (WID/TR/big CR)

#### 7.7.2 UE RF requirements

### 7.8 Rel-19 HPUE for NR intra-band CA and inter-band CA/DC with/without NR SUL

#### 7.8.1 Rapporteur input (WID/TR/big CR)

#### 7.8.2 UE RF requirements for intra-band CA

#### 7.8.3 UE RF requirements for inter-band CA/DC with high power on TDD band(s)

#### 7.8.4 UE RF requirements for inter-band CA/DC with high power on FDD band(s)

#### 7.8.5 UE RF requirements for inter-band CA/DC with high power on both FDD and TDD bands

### 7.9 Rel-19 Additional NR bands for NR features

#### 7.9.1 Rapporteur input (WID/TR/big CR)

#### 7.9.2 UE RF requirements for UL-MIMO in a single band

#### 7.9.3 UE RF requirements for 4Rx

#### 7.9.4 UE RF requirements for 8Rx

### 7.10 Rel-19 downlink interruption for NR and EN-DC band combinations at dynamic Tx Switching in Uplink

#### 7.10.1 Rapporteur input (WID/TR/big CR)

#### 7.10.2 UE RF requirements

### 7.11 Simultaneous Rx/Tx band combinations for NR CA/DC, NR SUL and LTE/NR DC in Rel-19

#### 7.11.1 Rapporteur input (WID/TR/big CR)

#### 7.11.2 UE RF requirements

### 7.12 Adding channel bandwidth(s) support to existing NR bands and CA/ENDC combinations in REL-19

#### 7.12.1 Rapporteur input (WID/TR/big CR)

#### 7.12.2 UE RF requirements

### 7.13 Introduction of the 1.4 GHz Band

#### 7.13.1 General aspects

#### 7.13.2 System parameters and UE RF requirements

#### 7.13.3 BS RF core requirements

#### 7.13.4 RRM core requirements

### 7.14 Introduction of LTE FDD band in 1800–1830 MHz for Canada

#### 7.14.1 General aspects

#### 7.14.2 System parameters and UE RF requirements

#### 7.14.3 BS RF core requirements

#### 7.14.4 RRM core requirements

### 7.15 Introduction of NR bands n87 and n88

#### 7.15.1 General aspects

#### 7.15.2 System parameters and UE RF requirements

#### 7.15.3 BS RF core requirements

#### 7.15.4 RRM core requirements

### 7.16 Introduction of NR band n68

#### 7.16.1 General aspects

#### 7.16.2 System parameters and UE RF requirements

#### 7.16.3 BS RF core requirements

#### 7.16.4 RRM core requirements

### 7.17 Introduction of NR-NTN S-band (MSS band 2000-2020 MHz UL and 2180-2200 MHz DL)

#### 7.17.1 General aspects

#### 7.17.2 System parameters and UE RF requirements

#### 7.17.3 SAN RF core requirements

#### 7.17.4 RRM core requirements

### 7.18 Introduction of IoT-NTN S-band (MSS band 2000-2020 MHz UL and 2180-2200 MHz DL)

#### 7.18.1 General aspects

#### 7.18.2 System parameters and UE RF requirements

#### 7.18.3 SAN RF core requirements

#### 7.18.4 RRM core requirements

### 7.19 Introduction of new NR NTN bands to support the Extended L-band (UL 1668-1675MHz, DL 1518-1525MHz) and the combined MSS L-band and Extended L-band ranges (DL 1518-1559 MHz, UL 1626.5-1660.5 MHz and 1668-1675 MHz)

#### 7.19.1 General aspects

#### 7.19.2 System parameters and UE RF requirements

#### 7.19.3 SAN RF core requirements

#### 7.19.4 RRM core requirements

### 7.20 Introduction of Power Class 2 and UE 40MHz Channel Bandwidth in NR band n28

#### 7.20.1 General and work plan

#### 7.20.2 UE RF requirements for PC2 with UL-MIMO

#### 7.20.3 UE RF requirements for introducing 40MHz

#### 7.20.4 Moderator summary and conclusions

## 8 Rel-19 on-going non-spectrum related work items

### 8.1 UE RF enhancements for NR FR1/FR2 and EN-DC, Phase 4

#### 8.1.1 UE RF requirements

##### 8.1.1.1 High power UE (HPUE) for CA in terrestrial network (TN)

###### 8.1.1.1.1 Intra-band contiguous and non-contiguous UL CA with PC1.5

###### 8.1.1.1.2 Inter-band UL NR-CA/EN-DC with 2 bands and 2Tx and/or 3Tx

###### 8.1.1.1.3 Increasing UE transmission high power limit

##### 8.1.1.2 Power domain enhancement for NR single carrier and NR intra-band UL CA for PC2 and PC3

###### 8.1.1.2.1 Power domain enhancements for single carrier

###### 8.1.1.2.2 MPR applicability for FR1 intra-band UL CA

###### 8.1.1.2.3 MPR applicability for FR2

##### 8.1.1.3 6Rx UE

###### 8.1.1.3.1 Reference sensitivity requirements

###### 8.1.1.3.2 MIMO layer evaluation for 6Rx UE

###### 8.1.1.3.3 SRS antenna switching requirements

###### 8.1.1.3.4 SRS IL imbalance

#### 8.1.2 RRM core requirements

#### 8.1.3 Moderator summary and conclusions

### 8.2 Study on IMT parameters for 4400 to 4800 MHz, 7125 to 8400 MHz and 14800 to 15350 MHz

#### 8.2.1 General aspects

#### 8.2.2 LS reply for NR in 4400 to 4800 MHz

#### 8.2.3 Study the IMT parameters relevant for sharing and compatibility for 7125 to 8400 MHz frequency range

#### 8.2.4 Study the IMT parameters relevant for sharing and compatibility for 14800 to 15350 MHz frequency range

##### 8.2.4.1 Co-existence assumptions/simulation

##### 8.2.4.2 Radio and antenna parameters

#### 8.2.5 Other aspects

#### 8.2.6 Moderator summary and conclusions

### 8.3 NR sidelink Intra-band Carrier Aggregation in ITS band

#### 8.3.1 General aspects

#### 8.3.2 UE RF requirements for intra-band non-contiguous CA

##### 8.3.2.1 System parameters

##### 8.3.2.2 Tx requirements (incl. MPR/A-MPR)

##### 8.3.2.3 Rx requirements

#### 8.3.3 UE RF requirements for intra-band contiguous CA

##### 8.3.3.1 System parameters

##### 8.3.3.2 Tx requirements (incl. MPR/A-MPR)

##### 8.3.3.3 Rx requirements

#### 8.3.4 Moderator summary and conclusions

### 8.4 NR channel BW less than 5MHz for FR1 Phase 2

#### 8.4.1 General aspects

#### 8.4.2 UE RF requirements for inter-band NR CA/DC with 3MHz CBW

#### 8.4.3 RRM core requirements

#### 8.4.4 Moderator summary and conclusions

### 8.5 Support of intra-band non-collocated EN-DC/NR-CA deployment Phase2: new receiver type(s)

#### 8.5.1 General aspects

#### 8.5.2 UE RF requirements

##### 8.5.2.1 UE RF requirements for Type 4a/4b capable FWA UE for EN-DC/NR-CA

##### 8.5.2.2 UE Capability/UE behavior and network signaling for Type 4 EN-DC/NR-CA

##### 8.5.2.3 Other aspects (incl. clarification of contiguous LTE CCs)

#### 8.5.3 RRM core requirements

#### 8.5.4 Moderator summary and conclusions

### 8.6 Study on NR FR1 DL Fragmented Carriers

#### 8.6.1 General aspects and work plan

#### 8.6.2 Methods for reducing the number of UE Rx chains

#### 8.6.3 Impacts on UE RF requirements and DL performance

#### 8.6.4 Moderator summary and conclusions

### 8.7 NR power class 2 RedCap (Reduced Capability) UE in FR1

#### 8.7.1 General aspects and work plan

#### 8.7.2 UE RF requirements

#### 8.7.3 Moderator summary and conclusions

### 8.8 Enhanced requirements and conductive test methodology for NR NTN and IoT NTN

#### 8.8.1 General aspects and work plan

#### 8.8.2 UE RF requirements for NTN HPUE

##### 8.8.2.1 Coexistence study for example bands

##### 8.8.2.2 Tx requirements

##### 8.8.2.3 Rx requirements

#### 8.8.3 Less than 5MHz for NTN

##### 8.8.3.1 System parameters

**R4-2411604 Discussion on system parameters of less than 5MHz for NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted**

**R4-2411855 Discussion on system parameters for NTN less than 5MHz**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2411949 Discussion on less than 5 MHz NTN system parameter aspects**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2412077 Discussion on system parameters for less than 5MHz in FR1-NTN bands**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412381 Discussion on system parameters for NTN support spectrum less than 5 MHz**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2412437 NTN System parameters for less than 5MHz CBW**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412529 System parameters for Less than 5MHz supporting in NTN FR1 bands**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2413145 System parameters and synchronization raster for NTN less than 5 MHz**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413232 Views on NR NTN Less than 5 MHz within wider channel BW**

*Type: discussion For: Discussion  
 Source: Inmarsat, Viasat*

**Abstract:**

MCC: This was not made available at tdoc submission deadline.

**Decision: Noted**

**R4-2413361 On system parameters for less than 5 MHz for NTN**

*Type: other For: Approval  
 Source: Ericsson India Private Limited*

**Decision: Noted**

##### 8.8.3.2 UE RF requirements

**R4-2411063 Discussion on UE RF requirements for NTN support spectrum less than 5 MHz**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411064 DraftCR for TS 38.101-5, Introduction on system parameters for UE supporting less than 5 MHz channel bandwidth**

*Type: draftCR For: Endorsement  
 38.101-5 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: CATT*

**Decision: Noted**

**R4-2411541 Supporting 3MHz BW for Redcap/eRedcap NTN**

*Type: discussion For: Discussion  
 Source: Sony*

**Decision: Noted**

**R4-2411605 Discussion on UE RF requirements of less than 5MHz for NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted**

**R4-2411856 Discussion on UE RF requirements for NTN less than 5MHz**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412078 Discussion on UE RF requirements for less than 5MHz in FR1-NTN bands**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412435 NTN UE RF requirements for less than 5MHz CBW**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412530 UE RF requirements for Less than 5MHz supporting in NTN FR1 bands**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2413362 On UE RF requirements for less than 5 MHz for NTN**

*Type: other For: Approval  
 Source: Ericsson India Private Limited*

**Decision: Noted**

##### 8.8.3.3 SAN RF core requirements

**R4-2411062 Discussion on SAN RF requirements for NTN support spectrum less than 5 MHz**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411065 DraftCR for TS 38.108, Introduction on system parameters for SAN supporting less than 5 MHz channel bandwidth**

*Type: draftCR For: Endorsement  
 38.108 v18.3.0 CR- rev Cat: B (Rel-19)  
  
 Source: CATT*

**Decision: Noted**

**R4-2411857 Discussion on SAN RF requirements for NTN less than 5MHz**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412528 SAN RF requirements for Less than 5MHz supporting in NTN FR1 bands**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2413363 On SAN RF core requirements for less than 5 MHz for NTN**

*Type: other For: Approval  
 Source: Ericsson India Private Limited*

**Decision: Noted**

##### 8.8.3.4 RRM core requirements

#### 8.8.4 NTN testing for NGSO

**R4-2411710 Discussion on NTN testing for NGSO**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2411722 Discussion on NTN testing for NGSO**

*Type: discussion For: Discussion  
 Source: QUALCOMM Europe Inc. - Spain*

**Decision: Noted**

**R4-2412532 NTN testing for NGSO**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412552 TE-emulated channel model for NTN UE demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson, Anritsu Corporation*

**Abstract:**

This contribution discusses our view on TE-emulated channel models for NTN UE demodulation requirements.

**Decision: Noted**

**R4-2412783 Discussion on NTN testing for NGSO for demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412866 Satellite Trajectory Motion and Channel Model for NTN test cases**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

[MCC]: Move R4-2412866 from AI 8.4.4 to AI 8.8.4 and treat it in [329].

**Decision: Noted**

**R4-2413333 Discussion on dynamic NTN testing for NGSO**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

As described in RP-240857 (New WID: Enhanced requirements and test methodology for NR and IoT NTN), given that the mobile services in the NGSO satellite is a rapidly growing market segment, the NTN UE performance is expected to be fully verified to ensure

**Decision: Noted**

#### 8.8.5 Moderator summary and conclusions

**R4-2413412 Topic summary for [112][312] NR\_IoT\_NTN\_less\_than\_5MHz\_UERF**

*Type: other For: Information  
 Source: Moderator (Xiaomi)*

**Abstract:**

[112] BDaT Session AI 8.8.3, 8.8.3.1. 8.8.3.2

**Decision: Noted**

**Issue 1-1-1: Channel bandwidth**

Nokia: To align with TN, 15 kHz SCS makes sense

**Issue 1-1-3: Maximum transmission bandwidth configuration(NRB)**

Viasat: Does this preclude 12 RB for SSB?

Huawei: 12 RB SSB is only for Band n100

Nokia: Here we are talking about transmission bandwidth configuration, not the SSB. The 12 RB for Band n100 was based on specific operator request for a transition. Is there any operator request for these NTN bands?

Viasat: We would like 12 RB transmission bandwidth configuration.

Nokia: This should be requested at RAN plenary.

Qualcomm: We would like to discuss this need further. The TN design was very specialized. We excluded the possibility for 15 RB for certain raster points, etc. There would be a large increase in complexity in the work to support this.

Samsung: Share the same view as Nokia and Qualcomm. There is significant impact to RAN4 for sync raster. Specialized points were defined. We would like further discussion.

ZTE, CATT: Same view as Nokia, Qualcomm, Samsung. We suggest only to consider 15 RB.

Ericsson: If we specify 12 RB, does it mean 15 cannot be used in some bands?

Viasat: We were clear at RAN that the main interest in the 12 RB. We need to check the exact wording in the WID but our understanding was the WID would not exclude the 12 RB configuration. We are ok to discuss further offline.

Samsung: 12 RB is possible without RAN1 impact. This can be within RAN4 scope. Assuming there is no impact to RAN1, we think the 12 RB can be discussed in RAN4 in the current WID.

Huawei: The WID says to reuse Rel-18 wherein 12 RB was only available for one band on one frequency. We cannot have 12 RB for every band as a general rule.

**Issue 1-1-5: Asymmetric channel bandwidth**

Viasat: We do need asymmetric channel bandwidth in Band n254. 3 MHz UL + X MHz DL

**Issue 1-1-6: Whether 3MHz channel bandwidth for NR-NTN in FR1-NTN bands is mandatory or optional?**

Xiaomi: 3 MHz is optional in TN because it was introduced in a later release.

CTC: Are there any existing UE’s on the market? If not, we prefer mandatory.

Viasat: Same view as CTC.

T-Mobile: For TN whenever a new bandwidth is introduced, it is optional in the first release and than mandatory in subsequent releases. If there no support on chipset and network, then there may be delay for NTN.

Samsung: Similar view as T-Mobile. We will try to reuse existing modem + RF from TN. 3 MHz requires additional features. We prefer optional, but would to keep open for further discussion.

Qualcomm: For TN, there is additional optionality in that if a UE supports 15 RB, it may still only optionally support 12 RB. We should see the final design for 3 MHz NTN before deciding optional or mandatory.

Nokia: We need to consider capability signaling whether the optionality can be per band or across all bands.

**Issue 1-2-2: Channel raster**

Qualcomm: We are ok with 10 kHz channel raster based on the band, but the sync raster should not make special accommodation.

Huawei: For Rel-18, we used 100 kHz and the WID indicates prioritizing Rel-18 so we think option 2 makes sense.

ZTE: All FR1 NTN bands all support 10 kHz raster. We are ok with option 1.

Ericsson: Also ok with option 1

Viasat: We also prefer option 1

T-Mobile: This was discussed in main room yesterday. Option 1 would be consistent with the main room discussion also.

**Issue 1-2-3: Synchronization raster**

Samsung: Option 1a and 1b are the same, but there is a missing part for 1b. N = 1:4999

Huawei: Note 1 should remove DCH transmission. Note 1 may need to be modified.

Nokia: There may be impact of 12 RB

Qualcomm: Same as Nokia. All of these proposals only consider 15 RB. Significant redesign would be needed if 12 RB is needed.

Ericsson: Agree with Huawei and Qualcomm. This note is from v18.4.0, but the note was modified in 18.5.0

CATT: We can ignore the note for now

Samsung: We should be clear that this sync raster is valid for 15 RB. If 12 RB is introduced, we would need a separate sync raster table.

Viasat: Agree with Qualcomm and Nokia to keep the sync raster open until we reach agreement on 12 RB.

Huawei: We can agree 15 RB now and add 12 RB later in a separate table if it’s agreed

CTC: The reason for 3 MHz is to improve the link budget. 12 RB for SSB is not a special request, but should be the default.

Samsung: What is the target frequency range that you want to place the 3 MHz channel with 12 RB. There are limited options for sync raster.

Nokia: Sync raster design needs to consider both 12 and 15 RB if they are both needed. The sync raster points need to be separable.

Qualcomm: Only 12 RB SSB design is available in RAN1. There is no 15 RB SSB. We would like to better understand the link budget concern.

CATT: 15 RB will not be precluded.

**Issue 2-1-3: A-MPR**

Qualcomm: we need to consider NS\_24 even if not included for LTE because we now of CP-OFDM

Viasat: We support the A-MPR study for 3 MHz

Nokia: It’s a little unclear whether we should study both 15 RB and 12 RB

Xiaomi: Need to consider NS\_02N, NS\_03N, NS\_04N, NS\_05N, and NS\_24

**R4-2413413 Topic summary for [112][313] NR\_IoT\_NTN\_less\_than\_5MHz\_BSRF**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

[112] BDaT Session AI 8.8.3, 8.8.3.1, 8.8.3.3

**Decision: Noted**

**Issue 1-1: Out-of-band emissions**

Ericsson: After further checking, we realize there is no specification impact. For NTN, this is according to ITU specification. Fine with option 1.

**Issue 1-2: FRC for Refsens**

ZTE: Option 1

Huawei: We should rename the FRC to indicate “NTN”. Otherwise option 1 is fine.

**Issue 1-3: FRC for Dynamic Range**

Ericsson: We did not intend to define a new FRC. We are ok with option 1

ZTE: Also agree with option 1

Huawei: We should rename the FRC to indicate “NTN”. Otherwise option 1 is fine.

Samsung: For in-channel selectivity, we also need to understand whether we can reuse the TN FRC as well G-FR1-A1-20.

Qualcomm: Check the FRC number for dynamic range, we think it should be A2.

Samsung: Refsens and dynamic range and in-channel selectivity requirements need to be derived also for 3 MHz. We expect a simple scaling may be sufficient. We would like to address this in the WF.

**R4-2413429 Topic summary for [112][329] NTN\_testing\_NGSO\_channel\_model**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

[112] BDaT Session AI 8.8.4

**Decision: Noted**

**Issue 1-1-1: Work plan on channel model and requirements**

Nokia: Without this agreement, what would change? Wouldn’t we always start with channel model?

Apple: What is the RF content?

Samsung: The WID mentions frequency error test cases. We don’t expect any core requirement changes, purely performance part.

Thales: RAN4 concern is only to make the channel more dynamic.

Samsung: Issue 1-2-3 for further discussion on RAN4 vs. RAN5 responsibility

Apple: RF requirements also contain side conditions. If we change side conditions, that is the same as a new core requirement. Can we remove the RF?

Samsung; RF aspect is in the WID: Inform RAN5 to assist specifying RF frequency error tests, if needed.

Samsung: We can add “demod, RF, and RRM test cases *if needed*”

**Issue 1-2-1 Methodology for Time varying Doppler and Delay shifts modelling (to be treated online)**

Thales: GMAT open source simulator is available. We are not against the mathematical model, but we have already done the work to evaluate the model.

Samsung: Is the GMAT output expressible in a mathematical equation? We would typically need such an equation to derive the demodulation requirements.

Nokia: The two alternatives are not mutually exclusive

Ericsson: How accurate do we need the model to be? A simplified model may be sufficient.

R&S: Our preference is alternative 1. We prefer Keplerien. We would rather not use data files.

Huawei: We also prefer option 1. One set of data is sufficient to verify Doppler and delay.

MediaTek: Ok with option 1. If the model is oversimplified, there may be some inconsistency with the UE internal model.

Qualcomm: The model used by GMAT is different from E-H and Keplerien models. Uses numerical integration based satellite prediction. We prefer alternative 1. We still need GMAT to establish the reference ephemeris data point. We may be able to use just a single initial ephemeris, or we may need to update to have a more realistic orbit.

Samsung: How do we judge whether a simplified model matches the actual orbit? GMAT could be used as a reference.

**Issue 1-2-2 Parameters for TE-emulated channel model**

Ericsson: We are defining minimum requirements, so LEO-600 is worst case. For elevation, it depends on the doppler but also test time.

Qualcomm: We should select a more general model, not one that only works for LEO-600 for example. The parameters can be discussed later so long as the model is general enough.

Huawei: Prefer option 1 to focus on LEO-600. Considering both test time and worst case parameter, we could consider starting from 30 deg for some duration depending on test time.

Samsung: These are input parameters to the channel model.

**R4-2413516 Way Forward for [112][329] NTN\_testing\_NGSO\_channel\_model**

*Type: For: Approval  
   
 Source: Samsung*

**Abstract:**

**Decision: Approved**

**R4-2413518 Way Forward for [112][313] NR\_IoT\_NTN\_less\_than\_5MHz\_BSRF**

*Type: For: Approval  
   
 Source: Nokia*

**Abstract:**

**Decision: Approved**

**R4-2413528 Way Forward for [112][312] NR\_IoT\_NTN\_less\_than\_5MHz\_UERF**

*Type: For: Approval  
   
 Source: Xiaomi*

**Abstract:**

**Decision: Approved**

### 8.9 Introduction of Ku Band for NR NTN

#### 8.9.1 General aspects and work plan

**R4-2411190 NTN Ku-band - Regulatory aspects and bands definition**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the regulatory aspects related to the Ku-band and make some initial proposals of NTN bands defintion

**Decision: Noted**

**R4-2411506 Ku Band Work Plan**

*Type: Work Plan For: Approval  
 Source: Intelsat*

**Decision: Approved**

**R4-2412960 Initial discussion on NR NTN Ku band**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

#### 8.9.2 Coexistence study based on ITU regulations

**R4-2411120 Discussion on coexistence evaluations for Ku-band for NR NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411188 NTN Ku-band - Coexistence**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the coexistence study for the Ku-band, listing missing parameters

**Decision: Noted**

**R4-2411507 Ku Band Co-existence**

*Type: discussion For: Discussion  
 Source: Intelsat*

**Decision: Noted**

**R4-2411658 Discussion on Ku band for NR NTN**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2411858 Discussion on coexistence study based on ITU regulations for NTN Ku band**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412560 Discussion on Ku-band co-ex studies**

*Type: discussion For: Discussion  
 Source: Samsung*

**Abstract:**

Ku-band coex assumptions

**Decision: Noted**

**R4-2412962 Discussion on coexistence study for NR NTN Ku Band**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412993 Regulatory status of NTN in bands above 10 GHz post WRC-23**

*Type: discussion For: Discussion  
 Source: Eutelsat Group*

**Decision: Noted**

**R4-2413036 The Need to Consider Linear Polarization in the Co-existence Studies for the Ku Band**

*Type: discussion For: Discussion  
 Source: SKY Perfect JSAT Corporation*

**Decision: Revised**

**R4-2413217 Consideration of Linear Polarization in Ku Band Coexistence Studies**

*Type: discussion For: Discussion  
 Source: SKY Perfect JSAT Corporation*

(Replaces R4-2413036)

**Decision: Noted**

#### 8.9.3 System parameters

**R4-2411121 Discussion on system parameters for Ku-band for NR NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411189 NTN Ku-band - FR1-NTN vs FR2-NTN**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses the pros and cons of the Ku-band(s) being part of FR1-NTN or FR2-NTN

**Decision: Noted**

**R4-2411481 Analysis of numerology options for Ku band**

*Type: discussion For: Discussion  
 Source: Eutelsat Group*

**Decision: Noted**

**R4-2411508 Ku Band Parameters and evaluation of FR1-NTN and FR2-NTN numerologies**

*Type: discussion For: Discussion  
 Source: Intelsat*

**Decision: Noted**

**R4-2411509 Channel Bandwidth Mapping**

*Type: discussion For: Discussion  
 Source: Intelsat*

**Decision: Noted**

**R4-2411777 Discussions on system parameters of Ku Band for NR NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2411839 Ku Band Channel Allocation for Legacy Satellite System**

*Type: discussion For: Discussion  
 Source: SKY Perfect JSAT*

**Abstract:**

To discuss the Ku-band SAN/UE channel bandwidth, focusing on the channel allocation to legacy satellites.

**Decision: Revised**

**R4-2411859 Discussion on system parameters for NTN Ku band**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2411950 Discussion on NR NTN system parameters for Ku band**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2412079 Discussion on system parameters for Ku band supporting NTN**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412131 Ku Band Channel Allocation for Legacy Satellite System**

*Type: discussion For: Discussion  
 Source: SKY Perfect JSAT*

(Replaces R4-2411839)

**Abstract:**

To discuss the Ku-band SAN/UE channel bandwidth, focusing on the channel allocation to legacy satellites.

**Decision: Withdrawn**

**R4-2412265 Discussion on NR NTN Ku band plan & system parameters**

*Type: discussion For: Discussion  
 Source: CHTTL*

**Decision: Noted**

**R4-2413020 Ku Band Channel Allocation for Legacy Satellite System**

*Type: discussion For: Discussion  
 Source: SKY Perfect JSAT Corporation*

**Decision: Revised**

**R4-2413247 Initial discussion on for Ku operating bands**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution, we provide initial discussion on the standardisation of the Ku band, looking into system parameters aspects.

**Decision: Noted**

**R4-2413458 Ku Band Channel Allocation for Legacy Satellite System**

*Type: discussion For: Discussion  
 Source: SKY Perfect JSAT Corporation*

(Replaces R4-2413020)

**Abstract:**

To discuss the Ku-band SAN/UE channel bandwidth, focusing on the channel allocation to legacy satellites.

**Decision: Noted**

#### 8.9.4 UE RF requirements

**R4-2411192 NTN Ku-band - UE RF requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution gives an overview on the impacts on UE RF requirements when introducing the Ku-band(s)

**Decision: Noted**

**R4-2411860 Discussion on UE RF requirements for NTN Ku band**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2411877 UE RF requirements for Ku band NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics*

**Abstract:**

It disscuses UE RF requirements for Ku band NTN

**Decision: Noted**

**R4-2412561 Discussion on Ku-band UE RF**

*Type: discussion For: Discussion  
 Source: Samsung*

**Abstract:**

Ku-band UE RF impacts

**Decision: Noted**

**R4-2412961 Initial discussion on VSAT requirements for NR NTN Ku band**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

#### 8.9.5 SAN RF core requirements

**R4-2411122 Discussion on SAN RF core requirements for Ku-band for NR NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411191 NTN Ku-band - SAN RF requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution gives an overview on the impacts on SAN RF requirements when introducing the Ku-band(s)

**Decision: Noted**

**R4-2411861 Discussion on SAN RF requirements for NTN Ku band**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

#### 8.9.6 Moderator summary and conclusions

**R4-2413414 Topic summary for [112][314] NR\_NTN\_Ku\_Band\_General**

*Type: other For: Information  
 Source: Moderator (Eutelsat)*

**Abstract:**

[112] BDaT Session AI 8.9.1, 8.9.2, 8.9.3

**Decision: Noted**

### Sub-topic 1-1: Work plan

Ericsson: The work plan states to conclude Ku band plan for 1a and 1b by October, but this may be challenging due to regulatory complexity

Huawei: Our proposal is to focus on priority 1. We cannot start priority 2 until decision is made on priority 1.

CHTTL: Work is contribution driven. The work plan is by topic, so there may be overlap between priority 1 and priority 2 band plans, but they are staggered.

Intelsat: There is synergy between priority 1 and 2. The approach is to treat priority 1 first and if time remains then also priority 2 topics.

Nokia: Is there a contingency in case priority 2 is not able to be treated?

Eutelsat: One option could be to downscope the work if needed

### Sub-topic 1-2: Band definitions

CHTTL: Since the moderator also proposes 13.75 – 14.0, we would like to propose our proposal 6 for the wider range as well as for all regions.

Ericsson: For Europe I have not yet found any regulation for 13.75 – 14.0 GHz. We would welcome more information on this range for consideration. Extending to all regions is unclear since we don’t know which regulations to look for. We have focused on CEPT for Region 1 so far.

Eutelsat: Agree with Ericsson on 13.75 – 14.0 GHz frequency range

Huawei: Having more bands is not an implementation burden as we saw in Ka band. We don’t need to aim for a single common global band. This will speed up the work.

CHTTL: We prefer to specify the entire range down to 13.75 GHz, but we think regional restrictions can be handled by notes in the spec.

Eutelsat: There are antenna size restrictions to 13.75 – 14.0 GHz.

Nokia: What is the band dependency on antenna size? Would we need to specify two bands for different antenna sizes?

CHTTL: We can narrow down to include the range 13.75 – 14.5 GHz only to Region 3.

Ericsson: Which regulation should apply for Region 3?

CHTTL: We only checked Taiwan so far. We invite companies to check other countries in Region 3.

Apple: The lower frequency range needs to be S-to-E

Nokia: Not against proposal 1, but like to understand the relationship with proposals 2 to 7

Eutelsat: Proposal 1 is Region 1

Thales: We would like to include Region 2 as well in the agreement.

### Sub-topic 2-1: Coexistence scope

Ericsson: We need to have coexistence study between TN/NTN to define ACS, ACLR requirements

Eutelsat: We should not study adjacent since there are no systems immediately adjacent. We need to take into account the frequency separation.

Charter: We cannot consider Region 2 until regulatory conditions are understood. We need to consider coexistence.

Huawei: For ACLR, we do not expect a problem. For ACS, we specify ACS and in-band blocking to be the same. Adjacent or next adjacent would have the same requirement. If we adopt the same approach, we wouldn’t need to have coexistence in the adjacent channel.

Intelsat: We need to consider Region 2 since there are other countries besides US in Region 2. For Ka there was nothing so hypothetical study could be justified, but it is not the case for Ku. There is a scientific band to use as a reference.

Qualcomm: ACS and ACLR also need to consider protection for other operators in the same band, not just other systems.

### Sub-topic 3-2: Numerology – decision criteria

Nokia: Why do we need beam hopping included? We don’t expect frequent beam change

Eutelsat: This isn’t a showstopper, but could have a performance impact on overall system performance

MediaTek: Besides FR1 and FR2 frequency ranges, we also need to include SCS and channel bandwidth. We have a paper indicating wider channel bandwidths may be problematic.

### Sub-topic 3-1: Frequency range definition

Nokia: Can we simply reuse/extend FR1 and FR2 frequency range or are there other structural changes needed?

Thales: it should be FR1-NTN and FR2-NTN

CHTTL: We understand the consequence of RAN plenary discussion precludes defining something new like FR3. That would be out of scope.

Eutelsat: We will need both conducted and OTA testing.

Huawei: We may have conducted and OTA that may be completely different from what we have today for FR1-NTN and FR2-NTN. We reuse either FR1 or FR2 numerology at least.

### Sub-topic 2-2: Coexistence scenarios

Qualcomm: If the other system is offset by several hundred MHz, then how do we simulate this, if we have a flat ACLR?

Eutelsat: We don’t know the answer to that

Thales: We can model the emission mask rather than direct simulation

LGE: The ACLR is assumed completely flat

Ericsson: We are concerned about trying to agree to a complicated model. The time required may not meet the work plan

### Sub-topic 2-3: Coexistence assumptions

**R4-2413415 Topic summary for [112][315] NR\_NTN\_Ku\_Band\_UE\_SAN\_RF**

*Type: other For: Information  
 Source: Moderator (CHTTL)*

**Abstract:**

[112] BDaT Session AI 8.9.4, 8.9.5

**Decision: Noted**

#### Issue 2-1-3: Impact on SAN RF requirements for the NTN Ku band

Ericsson: We suggest to postpone the discussion until we reach agreement on FR1 vs. FR2

Huawei: Agree with Ericsson

#### Issue 1-1-1: Supported VSAT Types in the NR NTN Ku band work

Ericsson: Mobile VSAT + NGSO is out of scope of the WI

Eutelsat: Intention is to bring mobile VSAT + NGSO proposal in December at RAN plenary. There are other antenna designs that may not be purely mechanical or electrically steered.

Thales: We agree to the moderator WF. We can reuse the same phrase for mechanical/electrical as for Ka band that implementations are not precluded.

Samsung: Agree with moderator proposal. Also agree that currently Mobile VSAT + NGSO is out of scope. We checked the WID and our understanding is we should reuse the Rel-18 Ka band which does not include mobile VSAT + NGSO.

Eutelsat: The antenna, aperture, pointing angles are the same whether it is mobile or fixed VSAT. We don’t expect mobility would make much difference to the coexistence study.

Thales: There is no impact of mobility to the coexistence study.

LGE: Current WID focus is on mobile VSAT + GSO only, but there is possibility for future consideration of NGSO in December. We can add a sentence that mobile VSAT + NGSO can be considered pending RAN approval

Ericsson: A few parameters differ in the coexistence analysis for mobile VSAT compared to fixed. Small differences.

Huawei: Agree with Samsung. We should strictly follow the WID. We don’t have technical concerns, but we do have procedural concerns.

Intelsat: All of our use cases are based on mobile VSAT. We think the coexistence analysis could apply to mobile VSAT as well, and we would welcome other companies view on this.

Thales: The small difference referred to by Ericsson is the height of the UE. It is very easy to incorporate this into the simulations.

CHTTL: Currently VSAT implies FR2, but we don’t want to bias the FR1 vs. FR2 discussion. The scope of this WF is for UE RF requirements only.

CHTTL: Proposal: “The current NTN VSAT types in 38.101-5 are considered in this Ku band work item ~~when discussing the UE RF requirements~~”

Chair: Since mobile VSAT + NGSO is not in scope of the WID, we cannot treat such aspects officially in the meeting until it is agreed at RAN plenary.

#### Issue 1-1-2: Open issues to be discussed

Samsung: What is the impact of common vs. separate antenna?

Huawei: The Tx/Rx separation is smaller for Ku than for Ka. If common antenna, the duplexer would need to be considered. For a phased array, many duplexers would need to be implemented which may not be feasible.

Thales: We propose to clarify in the italics: For electronic steering antenna, the parameters for the parameterized array antenna model can be discussed in RAN4 referring to *for example* the table 8.1.1-1 of TR 38.921. In response to Huawei comment, there may be half duplex implementations where duplexer is not necessary.

Intelsat: Common antenna is generally used for full duplex terminal. Lower cost terminals are half duplex.

Thales: Antenna aperture was already presented this meeting in a paper from Intelsat

**R4-2413519 Way Forward for [112][314] NR\_NTN\_Ku\_Band\_General**

*Type: For: Approval  
   
 Source: Eutelsat*

**Abstract:**

**Decision: Approved**

**R4-2413520 Ad-hoc meeting minutes for [112][314] NR\_NTN\_Ku\_Band\_General**

*Type: For: Information  
   
 Source: Eutelsat*

**Abstract:**

**Decision: Noted**

**R4-2413525 Way Forward for [112][315] NR\_NTN\_Ku\_Band\_UE\_SAN\_RF**

*Type: For: Approval  
   
 Source: CHTTL*

**Abstract:**

**Decision: Approved**

### 8.10 Enhancements for Air-to-ground network for NR

#### 8.10.1 General aspects

#### 8.10.2 UE RF requirements for CA and UL-MIMO

##### 8.10.2.1 Intra-band contiguous CA

##### 8.10.2.2 Inter-band CA

##### 8.10.2.3 UL-MIMO

##### 8.10.2.4 Others

#### 8.10.3 BS RF requirements for CA

**R4-2411726 (NR\_ATG\_enh-Core) Discussion on BS RF requirements for ATG with CA**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2411930 Discussion on RF requirements for ATG BS in Rel-19**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2411931 draft CR to TS 38.104: the introduction of Rel-19 ATG BS supporting CA**

*Type: draftCR For: Endorsement  
 38.104 v18.6.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Not pursued**

**R4-2413267 Discussion on remaining issues of ATG BS supporting CA**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper will discuss the remaining issues, i.e. how to handle CA TAE requirements for ATG BS in TS 38.104.

**Decision: Noted**

#### 8.10.4 RRM core requirements for CA

#### 8.10.5 Moderator summary and conclusions

**R4-2413406 Topic summary for [112][306] NR\_ATG\_enh**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

[112] BDaT Session AI 8.10.3

**Decision: Noted**

**Issue 1-1: Whether to****preclude DL MIMO for TAE requirements for ATG BS supports CA ?**

CMCC: We are ok with the moderator’s proposed WF not to include DL MIMO

**Issue 1-2: How to handle CA TAE requirements for ATG BS in TS38.104 based on the current WID?**

CMCC: We are ok to note the CR this meeting and further discuss in the next meeting how to change the wording

ZTE: We are ok to postpone the draft CR’s this meeting and come back next meeting. In the next meeting, we should focus on 38.104.

**R4-2413510 Way Forward for [112][306] NR\_ATG\_enh**

*Type: For: Approval  
   
 Source: ZTE*

**Abstract:**

**Decision: Approved**

### 8.11 NR base station (BS) RF requirement evolution for FR1/FR2 and testing

#### 8.11.1 General aspects

**R4-2411872 On general aspects related to BS RF evolution WI**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution this contribution we provide an overview of the work and some proposals to further simulate progress.

**Decision: Noted**

**R4-2413274 Draft CR to TS 38.104 Expected EIRP requirement inroduction**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

MCC: Not sure if this should be a draftCR to TS 38.104 without providing any WI code for the feature related to expected EIRP requirements. This need to be addressed by session chair.

**Decision: Noted**

#### 8.11.2 Expected EIRP mask for upper 6GHz

**R4-2411516 Views on EIRP mask considerations for upper 6GHz**

*Type: discussion For: Discussion  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2411641 Discussion on OTA spatial emission requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412704 TR 38.908 Protection of fixed satellite service (FSS) UL within 6425 to 7125 MHz**

*Type: draft TR For: Agreement  
 38.908 v0.0.0 CR- rev Cat: (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

**Abstract:**

This TR provide the draft skeleton for Protection of fixed satellite service (FSS) UL within 6425 to 7125 MHz according to the agreement reached during RAN4#110bis meeting.

**Decision:** The document was **withdrawn**.

**R4-2412705 TR 38.908 Protection of fixed satellite service (FSS) UL within 6425 to 7125 MHz**

*Type: draft TR For: Agreement  
 38.908 v0.1.0 CR- rev Cat: (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

**Abstract:**

This TR is to capture the TP agreed during the RAN4#112 meeting. MCC: This is assumed to be for post-meeting agreement. [Post-Meeting]

**Decision: Email approval**

**R4-2412706 Draft CR for introduction of U6GHz EIRP mask**

*Type: draftCR For: Endorsement  
 38.104 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

**Abstract:**

MCC: This is a draft CR for endorsement. This is a Rel-19 draftCR.

**Decision: Revised to R4-2413574 (from R4-2412706)**

**R4-2413574 Draft CR for introduction of U6GHz EIRP mask**

*Type: draftCR For: Endorsement  
 38.104 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

Abstract:

MCC: This is a draft CR for endorsement. This is a Rel-19 draftCR.

**Decision: Endorsed**

**R4-2412707 TP to TR 38.908 Background of U6GHz EEIRP mask requirement**

*Type: pCR For: Approval  
 38.908 v0.0.0 CR- rev Cat: (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Revised to R4-2413575 (from R4-2412707)**

**R4-2413575 TP to TR 38.908 Background of U6GHz EEIRP mask requirement**

*Type: pCR For: Approval  
 38.908 v0.0.0 CR- rev Cat: (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

**Decision: Approved**

**R4-2412898 On Expected EIRP mask core requirement**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

**R4-2413126 TR 38.908 Protection of fixed satellite service (FSS) UL within 6425 to 7125 MHz**

*Type: draft TR For: Agreement  
 38.908 v0.0.0 CR- rev Cat: (Rel-19)  
  
 Source: ZTE Corporation, Sanechips*

**Abstract:**

This TR provide the draft skeleton for Protection of fixed satellite service (FSS) UL within 6425 to 7125 MHz according to the agreement reached during RAN4#110bis meeting. MCC: This is assumed to be for post-meeting agreement. [Post-Meeting]

**Decision: Withdrawn**

**R4-2413219 Introduction of OTA spatial emission above the horizon requirement for BS operating in band n104**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Introduction of the new OTA spatial requirement for BS operating in band n104. MCC: This was not made available at tdoc submission deadline.

**Decision: Noted**

**R4-2413221 Draft CR to TR 38.xyz: Technical background information for FSS UL protection requirement for band n104**

*Type: other For: Endorsement  
 Source: Ericsson*

**Abstract:**

Text proposal for the technical report containing technical information related to OTA spatial requirement for BS operating in band n104. MCC: This was not made available at tdoc submission deadline. Not sure if this should be titled draftCR to a TR that

**Decision: Noted**

**R4-2413222 Draft CR to TS 38.104: Addition of spatial emission requirement to protect FSS UL within band n104 in subclause 9.9**

*Type: draftCR For: Endorsement  
 38.104 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: Ericsson*

**Abstract:**

Addition of new OTA spatial requirement for protection of FSS UL from interference generated by emissions above horizon from BS operating in band n104. MCC: This was not made available at tdoc submission deadline. This is a Rel-19 draftCR.

**Decision: Withdrawn**

**R4-2413275 EEIRP Beam direction definitions**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2413576 TP to TR 38.908 U6GHz EEIRP mask requirement**

*Type: For: Approval  
   
 Source: Samsung*

**Abstract:**

**Decision: Approved**

#### 8.11.3 OTA test enhancement

**R4-2411642 Discussion on OTA co-location reference antenna enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412708 Further discussion on OTA test enhancement**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412912 On the topic of BS RF evolution related to co-location requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on workflow and observations based on measurements of BS-BS isolation.

**Decision: Noted**

**R4-2413234 OTA test enhancements - CLTA**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

**R4-2413277 TX IMD requirements for high frequency band in FR1**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

#### 8.11.4 BS conformance testing

**R4-2411020 Step Wise Procedure for the Validation of EIRP**

*Type: discussion For: Discussion  
 Source: Spark NZ Ltd*

**Abstract:**

This contribution provides a step wise procedure for the measurement of EIRP mask for upper 6 GHz

**Decision: Noted**

**R4-2411078 Discussion on conformance test for EIRP mask for U6GHz**

*Type: discussion For: Discussion  
 Source: CATT*

**Abstract:**

MCC: This was not made available at tdoc submission deadline.

**Decision: Noted**

**R4-2411643 Discussion on OTA spatial emission conformance testing**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412709 Further discussion on Expected EIRP mask for upper 6GHz**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412899 Expected EIRP mask testing**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

**R4-2413220 Conformance test aspects for the requirement on OTA spatial emission above the horizon for BS operating in band n104**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Aspects related to conformance testing for compliance to the new OTA spatial requirement for BS operating in band n104. MCC: This was not made available at tdoc submission deadline.

**Decision: Noted**

**R4-2413276 Expected EIRP conformance – Test Vectors, MU budget and Conformance test method**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

#### 8.11.5 Moderator summary and conclusions

**R4-2413405 Topic summary for [112][305] NR\_BS\_RF**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

[112] BDaT Session AI 8.11.1, 8.11.2, 8.11.3, 8.11.4

**Decision: Noted**

**R4-2413508 Ad-hoc meeting minutes for [112][305] NR\_BS\_RF**

*Type: For: Information  
   
 Source: ZTE*

**Abstract:**

**Decision: Noted**

Samsung: Why remove “weighted” averaging?

ZTE: There was an impression among some companies that weighted implies uneven weighting

Samsung: Weighted could also mean equal weighting

Nokia: Averaging details and weighting can be further discussed

Samsung: The ITU expectation is weighted averaging. Weighted averaging could be either uniform or non-uniform.

ZTE: Regardless of whether we include weighting or not here, it will be discussed in conformance testing. We don’t have a strong opinion.

Spark: We haven’t yet discussed the weighting whether equal or unequal yet. It is still to be discussed.

Qualcomm: How about move the weighted to later in the sentence

with the ~~weighted~~ averaging being performed over ~~different~~ supported weighted beamforming directions within the BS horizontal and vertical steering range

**Issue 4-8: Test tolerance requirements**

ZTE: Since this is a regulatory requirement, TT must be zero

**Issue 4-4: RF channels for the conformance testing**

ZTE: Majority prefer only a single RF channel for testing, but need to decide whether it is T, B, or M

Spark: We need at least two RF channels – one at top and one at bottom, since the array performance is different.

ZTE: The final EEIRP is quite close irrespective of B, T, or M.

Spark: Regulatory requirement applies across the entire band. In order to ensure this, all ends of the band need to be tested.

Ericsson: For conformance testing, we need to reduce test time and limit the test cases. The most emission upwards needs to be tested. The top frequency is the worst case for the array design.

Spark: The array is designed for the midpoint of the frequency range. The spacing of elements is designed for mid frequency.

Ericsson: The elements are designed for center frequency, but the array separation is not set by the middle frequency. We design for top frequency for the array separation.

Spark: In WP5D, all simulations were done with spacing at mid frequency.

ZTE: The array design is implementation dependent. The assumption in 5D is not applicable to all vendors and implementations.

Huawei: We simulated M, B, and T with 10% frequency shift. The difference is quite small. To reduce the test effort, we think middle is acceptable but we are open to further discussion.

**Issue 3-1: General**

Samsung: We should focus the study on preparing for 6G, rather than defining new reference antenna for 5G. This should be for Rel-19 or later.

ZTE: Do not fully agree since 5G deployments may be ongoing for a long time still. Colocation definition should be valid for both 5G and future.

Ericsson: Similar view as Samsung. We should not come up with more strict requirements. For higher frequencies in FR1, it is difficult to find a reference antenna. We need a simple model to take into account array size, frequency, etc.

Huawei: For Rel-19 the scope is improvement in CLRA, not a replacement.

Nokia: If we change the colocation requirements, the impact is far reaching. We need to agree on deployemtn scenarios, frequency ranges, etc. This is a big undertaking. Although we assume all of the leakage is coming from the antenna, but that may not be the case. In the near field, it may not be the closest antenna that generates the most leakage. There is no evidence that 30 dB assumption is incorrect, even at 3.5 GHz.

ZTE: Can we focus on FR1 high bands (>2.5 GHz) to check the coupling loss between AAS BS? 30 dB seems to be very stringent compared to measured result. 40 – 50 dB could be more realistic.

Huawei: There is a misunderstanding on the 30 dB. The 30 dB is the requirement for conducted, but we have moved to OTA. For higher frequency, it is already understood OTA would not be 30 dB.

Ericsson: 30 dB is relevant for lower frequencies. For higher frequencies, we need another way to find the isolation for both conducted and radiated as 30 dB is not correct. We need to have the right model so as not to overdesign the filter.

Nokia: What is the operator and regulator input? A larger isolation would allow a smaller filter, but potentially larger emission into the other antenna system.

Spark: We need to be cautious/conservative. Any measurement techniques to justify the mask need to be presented to the regulators.

ZTE: ZTE, Ericsson, Nokia seem to be ok to study the high frequency bands, but what are the other views?

Ericsson: To progress the work for 6G, we should split the work. One to improve the existing CLRA today, and another effort for 6G to find a better way to model the isolation between antennas.

Nokia: Agree with Ericsson. We should focus on improving what we have today. Agree that splitting as suggested by Ericsson would be helpful.

ZTE: We are fine with the proposal, but different companies have different views on improvement. We should pick one or two candidates of improvement to focus on.

Huawei: We need to consult in RAN plenary when we talk about scoping, especially for 6G.

**Issue 3-2: Co-location reference antenna**

ZTE: The proposal 2 is not related to TxIM, spurious emissions, co-location. The proposal 2 seems to be more related to SBFD with same operator.

Samsung: We agree that the proposal is beyond the colocation aspect. For different operators, we do expect the separation could be larger.

**R4-2413509 Way Forward for [112][305] NR\_BS\_RF**

*Type: For: Approval  
   
 Source: ZTE*

**Abstract:**

**Decision: Approved**

### 8.12 TRP (Total Radiated Power), TRS (Total Radiated Sensitivity) and MIMO OTA (Over the Air) testing enhancement Phase 3

#### 8.12.1 General aspects

**R4-2412050 Reply LS on 3GPP NR TRP TRS OTA requirements**

*Type: LS out For: Approval  
 to GCF, cc 3GPP RAN Plenary, 3GPP RAN5, ETSI MSG TFES, GCF PAG, CTIA OTA WG, GSMA TSG-AP, NGMN Alliance, PTCRB, CCSA TC9 WG1  
 Source: vivo*

**Decision: Revised to R4-2413537 (from R4-2412050)**

**R4-2413537 Reply LS on 3GPP NR TRP TRS OTA requirements**

*Type: LS out For: Approval  
 to GCF, cc 3GPP RAN Plenary, 3GPP RAN5, ETSI MSG TFES, GCF PAG, CTIA OTA WG, GSMA TSG-AP, NGMN Alliance, PTCRB, CCSA TC9 WG1  
 Source: vivo*

**Decision: Approved**

**R4-2412056 Updated Workplan of Rel-19 OTA WI**

*Type: other For: Approval  
 Source: vivo, CAICT*

**Decision: Approved**

#### 8.12.2 Core requirements

##### 8.12.2.1 Test methodology for FR1 non-RedCap headworn XR devices

**R4-2411025 On XR devices test**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

proposals on XR device test procedures

**Decision: Noted**

**R4-2411149 Headworn XR test scenarios and configurations**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2411695 On XR UE OTA test**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412263 Discussion on OTA Test for XR Devices**

*Type: discussion For: Discussion  
 Source: Meta*

**Decision: Noted**

**R4-2412496 On the prioritization of XR device type for OTA test methodology**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2412677 Discusion on XR OTA test method**

*Type: other For: Approval  
 Source: CAICT, SAICT*

**Decision: Noted**

**R4-2413195 Test methodology for FR1 non-RedCap headworn XR devices**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

##### 8.12.2.2 Test methodology and radiated performance metric for FR1 NTN devices

**R4-2411024 on NTN tests**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

proposals on test procedures and performance metrics

**Decision: Noted**

**R4-2411253 NTN OTA Test Metrics**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Decision: Noted**

**R4-2411545 Examples of FR1 NTN high-gain and VSAT-like terminals OTA characteristics**

*Type: discussion For: Discussion  
 Source: Inmarsat, Viasat*

**Abstract:**

An informative paper on the current ecosystem of FR1 VSAT-like Terminals

**Decision:** The document was **withdrawn**.

**R4-2411546 Views on usage modes and framework for FR1 NTN UE OTA**

*Type: discussion For: Discussion  
 Source: Inmarsat, Viasat*

**Decision: Noted**

**R4-2411598 Discussion on OTA test for FR1 NTN devices**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted**

**R4-2411696 On NTN UE OTA test**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412055 Discussions on NTN OTA test method**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412497 On NTN OTA**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2412678 Discussion on NTN OTA test method**

*Type: discussion For: Discussion  
 Source: CAICT, SAICT*

**Decision: Noted**

**R4-2412920 On FR1 NTN devices OTA**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413196 Test methodology and radiated performance metric for FR1 NTN devices**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2413451 Examples of FR1 NTN high-gain and VSAT-like terminals OTA characteristics**

*Type: discussion For: Discussion  
 Source: Inmarsat, Viasat*

**Decision: Noted**

##### 8.12.2.3 FR1 dynamic MIMO OTA test methodology

**R4-2411023 On MIMO dynamic OTA tests**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

proposals on dynamic channels and response from test equipment

**Decision: Noted**

**R4-2411252 TP on Dynamic MIMO Aspects**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd, Spirent Communications*

**Decision: Revised to R4-2413536 (from R4-2411252)**

**R4-2413536 TP on Dynamic MIMO Aspects**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd, Spirent Communications*

**Decision: Approved**

**R4-2411264 On FR1 MIMO OTA Dynamic Channel model alignment with other SDO**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2411265 Discussion on FR1 MIMO OTA FoM definitions**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2411572 On FR1 dynamic MIMO OTA**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Noted**

**R4-2411573 TR 38.762 skeleton on MIMO OTA dynamic test methodology for FR1 UEs**

*Type: draft TR For: Agreement  
 38.762 v0.0.1 CR- rev Cat: (Rel-19)  
  
 Source: CAICT*

**Decision: Agreed**

**R4-2411697 On FR1 dynamic MIMO OTA**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412921 Discussion on FR1 dynamic MIMO OTA test methodology**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413197 FR1 dynamic MIMO OTA test methodology**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

#### 8.12.3 Performance requirements

**R4-2412060 Discussions on Rel-19 FR1 OTA requirement work**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

#### 8.12.4 Moderator summary and conclusions

**R4-2413433 Topic summary for [112][333] TRP\_TRS\_MIMO\_OTA**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

[112] BDaT Session AI 8.12.1, 8.12.2, 8.12.2.1, 8.12.2.2, 8.12.2.3, 8.12.3

**Decision: Noted**

**Issue 2-1-1: Discussions on Reply LS from CTIA on XR OTA test phantom**

Huawei: For the positioning guideline, will there be separate for glasses and heads up display

Keysight: No clarification yet

**Issue 2-1-2: Whether RAN4 need (and how) to categorize XR device type**

Meta: What is smartphone XR? Is it a tethered device to the smartphone?

Samsung: Last meeting’s WF mentioned test method for XR includes everything except smartphone XR. Smartphone XR is already precluded from last meeting, but the wording may not have been clear.

Apple: Prefer option 1

Samsung: Would the test method be different for different categories? We think the test method can be the same.

Huawei: The test method should be the same, but the positioning could be different.

Oppo: Will we have different requirements for different categories?

Huawei: Yes. The space for antenna design is limited in glasses compared to head mounted display.

Samsung: Agree to focus on the two types glasses and head mounted display. We should only consider XR with embedded 5G module, i.e., not tethered

Vivo: Do we need to send this kind of information to CTIA about these types?

Huawei: We do. In the reply LS, we should supply this information and ask CTIA to provide position guideline for both.

Samsung: Similar view as Huawei

**Issue 2-1-4: Whether WI should focus on the XR devices those connected to gNB directly**

Huawei: Option 1. The radio requirement for sidelink is completely different than the connection to the gNB.

Oppo: Also support option 1. The test configurations will be much different for sidelink

Samsung: Option 1

Apple: Option 1

**Issue 2-1-6: Prioritize 1Tx XR devices?**

Oppo: Support the proposal to prioritize 1Tx

**Issue 2-1-7: How to identify 2Rx XR devices?**

Vivo: Can the TE display this information? supportOf2RxXR-r18

R&S: We can display it, but not sure if devices sets IE correctly. Can read from the UE, but for devices not certified, may not be set. All devices may not set it correctly.

Keysight: If it is signaled, it is accessible and can be displayed

Huawei: There may be 1Rx that may not set this IE. If not set, the device is assumed to be 4Rx.

TIM: We never decided for 1Rx. We are expecting at least 2Rx.

Huawei: This is just a hypothetical example. We are not saying 1Rx would happen, but it could happen.

Apple: If the TE vendor does not show the 2Rx capability, is there a fallback for the UE to indicate 2Rx?

Vivo: UE declaration could be another approach

**Issue 3-1-1: Usage scenarios for NR-NTN mobile handheld UE**

Apple: Option 1 considering NTN networks are still nascent. We expect primarily text messaging or emergency texting which corresponds to browsing mode only.

Viasat: We should not restrict how a mobile could be used. We support option 5.

Samsung: We support option 1. Options 4 and 5 list all the scenarios so there is no prioritization. We should focus on the most typical scenarios. Most important case is the emergency case. We should prioritize browsing mode.

Qualcomm: Voice is a typical scenario for NR NTN. Hand only talk mode could be considered in addition to hand only browsing mode.

Viasat: We don’t want to exclude head+hand in the priorization. So we propose hand and head+hand.

Vivo: We also think head+hand talk mode is useful.

Apple: We expect a positioning app in the phone to help the user aim the phone. This requires the user to view the screen which would be browsing mode.

Viasat: We don’t want to assume the use of an app for positioning. We think the coverage should be provided by design rather than requiring a fixed direction of pointing.

Keysight: Upside down in a pocket would requires an upper-leg phantom which is not available.

Samsung: Usage scenario should be discussed together with performance metric.

Apple: We should focus on one usage scenario to define a new test metric for. Otherwise, we can consider the legacy metrics and only need to work on aspects such as positioning.

Viasat: We can provide more information in the next meeting regarding the different usage scenarios and associated test metric.

Huawei: Any views from other satellite operators?

Apple: can we take hand only browsing mode as a baseline? Further contributions on other usage scenarios are not precluded.

**Issue 3-1-2: Consideration on NTN antenna**

Vivo: Is there a need to consider antenna switching for OTA testing?

Apple: These are UE implementation details. The metric should be testable for the various implementations, but we don’t need to capture this in the spec.

**Issue 3-1-4: UE type for IoT-NTN**

Viasat: We should focus on handheld devices but ok to deprioritize IoT NTN devices altogether

Apple: The only satellite networks are IoT NTN, not NR NTN. We should not completely deprioritize IoT NTN because it may be the only commercially viable devices for several years. We carry on with handheld UE but we ensure that whatever is specificied can be applicable to handheld UE supporting IoT NTN.

Sony: Same view as Apple. IoT NTN is not only for industrial application, it can also be used for handheld.

Huawei: If the IoT NTN is in a smartphone, it is ok. We are just trying to exclude the “industrial” type of IoT devices on tractor, boat, etc.

Viasat: IoT NTN may not only be for mobile handset, it could be for safety devices that have different form factor. This would expand the scope of the work.

Apple: There is no need for GCF for customized devices since these are completely operator controlled. We are not in favor of including non-smartphone form factor IoT devices in this work.

**Issue 3-2-1: Whether full sphere or partial sphere (including half sphere) should be measured?**

Apple: Can we focus on test metric rather than the measurement method?

Huawei: Easier to measure over the full sphere and then postprocess since we don’t know where the main lobe is.

Samsung: Agree with Huawei. Measurement should be full sphere, metric could be localized

Viasat: Also agree.

Nokia: Half sphere measurement is possible with UE vendor declaration.

Huawei: We should not rely on declaration. We should construct a blind test.

Oppo: Partial sphere is enough for many implementations. We don’t need to measure the entire sphere. We can define the exact partial sphere as part of the test metric.

Viasat: If we limit ourselves to partial sphere, but we agree to additional use cases in the future, then we would be limited.

Nokia: We can use full sphere or partial sphere according to the use case or other consideration. For example, full sphere for FR1 and partial sphere for FR2.

Samsung: This work item only considers FR1.

**Issue 3-2-2: Categorized performance metric for NR-NTN handheld UE**

Apple: We support partial sphere CDF, but we still need sin(theta) weighting

Viasat: Whatever we decide for directionality, we still need full sphere TRP/TRS

**Issue 4-1-3: On adopting CTIA UMi and UMa channel models**

Apple: We have working in CTIA for the past 2 years to come up with pass/fail criteria. It’s taken a long time, so it’s infeasible for RAN4 to start from scratch.

Huawei: Agree to use Uma and Umi, but we don’t need to use the dataset.

MVG: We have worked in CTIA for 2 years, but we don’t know that it meets the target. We don’t have a complete set of data that meets the target.

Keysight: We are ok to adopt major portions of CTIA work, but there are certain aspects not agreeable here; i.e., SIR vs. noise limited.

ETS: We are close to finishing the channel model in CTIA. We should not start over again. The limits have not yet been defined yet, so it’s premature to suggest that the work is not appropriate.

Spirent: Support Keysight and ETS.

Apple: The work is not completely done in CTIA, but is quite far advanced. The alternative to start over is infeasible in the timeframe available.

MVG: The results from CTIA are not even close to the targets. We do agree with comment from Apple.

Keysight: Dynamic channel modelling and link adaptation are new concepts for OTA. We feel confident we will be able to conclude in CTIA. We will resolve the discrepancies that have been reported.

Spirent: We have full confidence the results will converge in CTIA.

Nokia: If any further work is needed in 3GPP using the CTIA channel model as a baseline, we can consider our proposal.

**Issue 4-2-1: Link adaption configuration for Dynamic FR1 MIMO OTA**

Qualcomm: We suggest using the parameters in 38.101-4

Huawei: It should be 38.214, not 38.124

Samsung: Agree with Qualcomm

**R4-2413535 Way Forward for [112][333] TRP\_TRS\_MIMO\_OTA**

*Type: For: Approval  
   
 Source: vivo*

**Abstract:**

**Decision: Revised to R4-2413603 (from R4-2413535)**

**R4-2413603 Way Forward for [112][333] TRP\_TRS\_MIMO\_OTA**

*Type: For: Approval  
   
 Source: vivo*

Abstract:

**Decision: Approved**

### 8.13 Study on NR FR2 OTA (Over the Air) testing enhancement Phase 3

#### 8.13.1 General aspects

**R4-2413229 VSAT testability SID proposal**

*Type: other For: Approval  
 Source: Eutelsat Group*

**Decision:** The document was **not treated**.

**R4-2413263 Skeleton of TR 38.xyz: Study on NR frequency range 2 (FR2) OTA (Over the Air) testing Phase 3**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2413533 (from R4-2413263)**

**R4-2413533 Skeleton of TR 38.xyz: Study on NR frequency range 2 (FR2) OTA (Over the Air) testing Phase 3**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Approved**

#### 8.13.2 RF testing methodology for FR2 non-handheld UE that can transmit simultaneously with multi-panel

**R4-2411531 Discussion on STxMP measurement limitations**

*Type: discussion For: Discussion  
 Source: Rohde & Schwarz*

**Decision: Noted**

**R4-2411698 On FR2 OTA testing of STxMP**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412072 Discussion on the test method for sTxMP**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412919 Discussion on FR2 OTA test method on STxMP**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413198 RF testing methodology for FR2 non-handheld UE that can transmit simultaneously with multi-pane**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

#### 8.13.3 Moderator summary and conclusions

**R4-2413434 Topic summary for [112][334] NR\_FR2\_OTA**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

[112] BDaT Session AI 8.13.1, 8.13.2

**Decision: Noted**

**Issue 1-1-1: Signal level condition for measuring/distinguishing EIRP per TCI**

**Issue 1-2-1: AoA separation and UE orientation for EIRP PUMAX,f,c,k testing**

Qualcomm: We would not like to introduce a test mode which would be required from proposal 1. We can accept proposal 2 or 3.

Vivo: We want to avoid beam peak search.

Samsung: Beam peak search is the difference between our proposal and others. We can also consider other proposals to skip the beam peak search by offline processing.

Keysight: Concerned about plethora of declarations. The declarations may depend on the test system. This is too much detail for a vendor declaration. A true beam peak search for two panels could be done by test mode. But a multi-Rx test system, may not be able to resolve the beam directions.

Qualcomm: Proposal 3 may have testability issues. Proposal 2 could be a compromise.

Keysight: Different test systems with different probe locations would give different results as we scan 30, 60, 90, 120, 150 degrees.

Samsung: We already agreed the probes would be standardized so the tests can be repeatable across labs. Proposal 2 is a middle ground.

**Issue 1-2-2: Applicability of ΔMPRSTxMP, MPR and A-MPR for EIRP PUMAX,f,c,k testing**

Vivo: 3 dB relaxation is used to enable the single carier requirement

Samsung: We can focus on MOP. We can skip MPR.

**R4-2413534 Way Forward for [112][334] NR\_FR2\_OTA**

*Type: For: Approval  
   
 Source: Qualcomm*

**Abstract:**

**Decision: Approved**

### 8.14 Study on spatial channel model for demodulation performance requirements

#### 8.14.1 General aspects and work plan

**R4-2411044 Work Plan for Spatial Channel Model Study Item**

*Type: Work Plan For: Approval  
 Source: Nokia*

**Decision: Approved**

**R4-2411557 Scenarios and Requirements for Spatial Channel Modelling**

*Type: discussion For: Discussion  
 Source: BT plc*

**Decision: Noted**

**R4-2412320 General view on SCM for demodulation**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General view for SCM

**Decision: Noted**

#### 8.14.2 Spatial channel modelling methodology

**R4-2411119 Discussion on spatial channel modelling methodology**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411300 Discussion on Spatial Channel Model for Demodulation Performance Requirements**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

This contribution introduces a TS 38.827 based CDL spatial channel model and compares it with legacy TDL models to evaluate its usefulness and advantages in the context of minimum demodulation performance requirements for MIMO features.

**Decision: Noted**

**R4-2411301 Simulation Results and CDL Implementation for Spatial Channel Model for Demodulation Performance Requirements**

*Type: discussion For: Discussion  
 Source: Nokia*

**Abstract:**

This informative contribution is intended to help with implementation and alignment of a TS 38.827 based CDL channel model. This is a companion contribution to our FS\_NR\_demod\_SCM discussion and contains the complete context and extended results for the s

**Decision: Noted**

**R4-2411390 On Spatial Channel Modeling for Demodulation Requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2412321 Discussion on SCM methodology**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

methodology discussion

**Decision: Noted**

**R4-2412322 Simulation results for SCM**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results

**Decision: Noted**

**R4-2412328 Discussion on Spatial Channel Modelling**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2412535 Initial view on spatial channel modelling SI**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412762 Overviews on spatial channel model for demodulation requirements**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412793 Discussion on spatial channel model for demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2413056 Initial Considerations on the study on SCM for demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413272 On Rel-19 spatial channel model for demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: Keysight Technologies UK Ltd*

**Decision: Noted**

#### 8.14.3 Moderator summary and conclusions

**R4-2413427 Topic summary for [112][327] NR\_SCM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

[112] BDaT Session AI 8.14.1, 8.14.2

**Decision: Noted**

**R4-2413521 Offline meeting minutes for [112][327] NR\_SCM**

*Type: For: Information  
   
 Source: Nokia*

**Abstract:**

**Decision: Revised to R4-2413568 (from R4-2413521)**

**R4-2413568 Offline meeting minutes for [112][327] NR\_SCM**

*Type: For: Information  
   
 Source: Nokia*

Abstract:

**Decision: Noted**

**Issue 2-1-5: Test Cases for SU-MIMO (if agreed)**

CATT: Does the SI include both UL and DL?

Nokia: This is the starting point to start from PDSCH. Later we will extend. We would like to keep the discussions agnostic to UL and DL.

Samsung: We discussed PDSCH TPUT for random PMI and fixed PMI. Which one should we align?

Moderator: We don’t have agreement on that aspect yet. We welcome the views from companies.

Nokia: Our preference is random, fixed, and follow PMI, prioritized in this order.

Apple: Should we have assumptions on fixed? We don’t have experience for 8Tx fixed codebook.

Nokia: There is no identity precoder in type 1. We can use follow PMI and choose the most common precoder that comes out.

Moderator: We can select the fixed precoder next meeting based on proposals and simulations from the companies.

Huawei: Choose the best precoder which is equivalent to follow PMI.

Qualcomm: Another alternative is to run a short simulation with all precoders and pick the one that’s the best. Each company can use their own alternative how to select the “best” precoder

Apple: Do we assume sub-band or wide band precoding?

Nokia: Everything. The simulation results so far have been for wideband, so perhaps we can use that.

MediaTek: Do we limit to Type 1 codebook?

Nokia: Type 1 single panel for alignment on single user MIMO

Samsung: Depending on the channel model, wideband or sub-band may be better

CTC: We did not observe much difference between wideband and sub-band for TDL. There may be larger differences for CDL, however, for channels with larger delay spread. We also need to understand the CSI-RS and beam steering aspects.

Huawei: We should focus on spatial channel component, not the delay spread. We suggest wideband precoding.

Moderator: We suggest further offline discussion on wideband vs. sub-band precoding.

**Issue 2-2-1: Tap Delay Line Parameters**

Huawei: There are too many cases. These all have same spatial channel component. We should downselect to one.

Nokia: Similar understanding to Huawei. The agreed cases are for low correlation so we should also pick another with not low correlation.

ZTE: Why do we need low correlation?

Nokia: To be able to compare with legacy which are mostly low correlation non-spatial models

Moderator: To observe the shortcomings of the existing models

Samsung: ULA low cases are used for Tx <= 4. 8Tx is used for FWA. We use cross polarization for high Tx cases, so we should consider this instead of ULA.

Nokia: We are not against cross-pol antenna matrices. The study does not distinguish between FWA and handheld. If it is found there is a difference, that can be checked.

Apple: We used ULA in 8Rx because assumption was FWA. For CDL, we should use cross-pol.

Nokia: For non-low correlation, we could not find a testable SNR so we were forced to go with low.

Samsung: We do not agree TDL ULA Low because we don’t think it’s a fair comparison for spatial channels. If the comparison is against legacy, we only have 4Rx for handheld. Legacy 8Rx is only for FWA.

MediaTek: Our preference is to include both low correlation and non-low correlation. This shows both aspects. Both are valid for comparison with legacy.

Huawei: Similar view as MTK to include both spatial and non-spatial. We don’t need cross-pol, we can focus on ULA.

Qualcomm: Similar view as MTK. If we include both because it’s too early to know how CDL will compare. If we downselect now, we may miss some key observations for comparison.

BT: Agree with Qualcomm.

Ericsson: Also agree with Qualcomm. Comparison between TDL and CDL is the key here.

CTC: Also agree with Ericsson, BT, Qualcomm, and MTK. We are looking to observe the limitation of TDL.

**Issue 2-3-1: Cluster Delay Model**

Nokia: Most companies prefer 38.827 model since the 38.921 model was found to be problematic. We want to compare speed and doppler between the TDL and CDL models.

Qualcomm: We don’t know that we need to match delay and doppler. What is the goal of this? Comparing convergence time is not the goal. Do we use 38.827 model as-is, or do we still need further modifications?

Nokia: We agree that it’s not necessary to match delay and doppler. However, if we find differences in the results, how do we know it is coming from delay spread and doppler, or from the spatial component? If all companies agree that delay spread and doppler are not dominating the performance difference, then we are fine. The metric for performance is still up for discussion, not necessarily the SNR at 70% throughput. To make 38.827 model work, we still need to assume Rx antenna configuration of the channel. We tried to match the assumptions that was used for ULA.

Apple: Nokia is suggesting a directional antenna in Rx. This is not equivalent to what we used for TDL. We don’t have Rx beamforming for TDL.

Nokia: TDL does not have a spatial component.

Moderator: Can we discuss offline before the next meeting?

**Issue 2-4-5: Comparison Approach**

BT: MU-MIMO is an important case, we want to include MU-MIMO as a test case and to start discussing the details. It is a part of the SID.

Huawei: Can we agree MMSE-IRC as the reference receiver?

Apple: MU-MIMO progress has been lacking due to the multiple assumptions including 2 or 3 UE receivers. We would like to stick with the usual assumptions and configurations we’ve been using in RAN4 demod. We do not think it is appropriate to simulate multiple UE’s in the MU-MIMO evaluations.

Nokia: We understand the concern. However, in MU-MIMO is not tested properly if we use simplified simulation. We should not discard the possibility of more complex simulations.

CTC: Agree with BT that MU-MIMO is an important case. Agree with MMSE-IRC as it is a mandatory requirement. We only need to consider this type of receiver. We only focused the throughput of the target UE in previous studies; not the performance of the co-scheduled UE for which we only choose the precoder. In this case, the complexity should be manageable.

MediaTek: Also agree with MMSE-IRC. Also think MU-MIMO is important, but the complexity needs to be reasonable. We want to use link level simulation. We are not doing system level simulations for demodulation evaluation.

Huawei: We do not need MU-MIMO test since we already have 8-layer test case. We will have already checked inter-layer interference.

Qualcomm: See the value in MU-MIMO, but we need to consider the time and scope of SI. We need to limit the scope. Workload could be a concern if we add too many test cases.

**R4-2413567 Way Forward for [112][327] NR\_SCM**

*Type: For: Approval  
   
 Source: Nokia*

**Abstract:**

**Decision: Revised to R4-2413606 (from R4-2413567)**

**R4-2413606 Way Forward for [112][327] NR\_SCM**

*Type: For: Approval  
   
 Source: Nokia*

Abstract:

**Decision: Approved**

### 8.15 NR Radio Resource Management (RRM) Phase 5

#### 8.15.1 General aspects

#### 8.15.2 FR2-1 SSB based L3 measurement delay reduction for connected mode

##### 8.15.2.1 FR2-1 L3 measurement delay by optimizing Rx beam sweeping factor

##### 8.15.2.2 FR2-1 L3 measurement delay by optimizing CSSF outside gap in CA/DC

#### 8.15.3 Fast SCell activation for UE supporting Rel-18 EMR

#### 8.15.4 Moderator summary and conclusions

### 8.16 NR demodulation performance Phase 5

#### 8.16.1 General aspects and work plan

**R4-2411182 Work plan for NR demodulation performance: Phase 5**

*Type: Work Plan For: Approval  
 Source: China Telecom, NTT DOCOMO*

**Decision: Revised to R4-2413569 (from R4-2411182)**

**R4-2413569 Work plan for NR demodulation performance: Phase 5**

*Type: Work Plan For: Approval  
 Source: China Telecom, NTT DOCOMO*

**Decision: Approved**

MediaTek: The UE part of work plan might be too aggressive in 4 meetings

CTC: We aren’t expecting such high workload for the UE. But we can update the work plan to 7 meetings for UE, same as BS.

**R4-2412143 On general issues for demodulation requirement with interference**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses general issues related to the interference cancellation including UE and BS

**Decision: Noted**

#### 8.16.2 UE demodulation performance requirements for 8Rx with MMSE-IRC

**R4-2411026 Discussion on UE requirements with 8Rx MMSE-IRC receiver**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2411027 Discussion on 8Rx MMSE-IRC PDSCH requirements for scenario with intra-cell inter-user interference**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2411045 Discussion on 8Rx UE Demodulation with MMSE-IRC receiver**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2411183 Discussion on UE demodulation performance requirements for 8Rx with MMSE-IRC**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2411391 On UE demodulation performance requirements with 8RX**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2411759 (NR\_demod\_Ph5-Perf) Discussion on interference suppressing performance for 8Rx UE**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2412144 On MMSE-IRC receiver for interference mitigation with 8Rx**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the parameter assumption for PDSCH and CQI reporting requirement

**Decision: Noted**

**R4-2412464 Views on 8Rx UE demodulation and CSI requirements with inter-cell and intra-cell interference**

*Type: discussion For: Discussion  
 Source: QUALCOMM Europe Inc. - Spain*

**Decision: Noted**

**R4-2412763 Overviews on UE 8Rx IRC performance requirements with interference**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412790 Discussion on UE demodulation performance requirements for 8Rx with MMSE-IRC**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412878 Discussion on UE demodulation performance requirements for 8Rx with MMSE-IRC**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Noted**

#### 8.16.3 BS demodulation performance requirements for MMSE-IRC

**R4-2411118 Discussion on BS demodulation performance for MMSE-IRC**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411184 Discussion on BS demodulation performance requirements for MMSE-IRC**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2411517 Views on BS demodulation requirements for MMSE-IRC**

*Type: discussion For: Discussion  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2411760 (NR\_demod\_Ph5-Perf) Discussion on BS demodulation requirements for interference suppressing with MMSE-IRC receiver**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2412319 Discussion on MMSE-IRC BS demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General view for MMSE-IRC requirements

**Decision: Noted**

**R4-2412333 BS demodulation performance requirements for MMSE-IRC**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted**

**R4-2412764 Overviews on BS IRC performance requirements with inter cell interference**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2412791 Discussion on BS demodulation performance requirements MMSE-IRC**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412905 NR Demodulation Performance Phase 5: BS Demodulation Performance Requirements for MMSE-IRC**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2413444 Initial discussion on BS demodulation requirement with MMSE-IRC receiver**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

#### 8.16.4 Moderator summary and conclusions

**R4-2413428 Topic summary for [112][328] NR\_demod\_Ph5**

*Type: other For: Information  
 Source: Moderator (China Telecom)*

**Abstract:**

[112] BDaT Session AI 8.16.1, 8.16.2, 8.16.3

**Decision: Noted**

**R4-2413565 Offline meeting minutes for [112][328] NR\_demod\_Ph5**

*Type: For: Information  
   
 Source: China Telecom*

**Abstract:**

**Decision: Noted**

**Issue 2-1-2: 8Rx UE MMSE-IRC receiver assumption**

Nokia: In rel-18, the difference between 8Rx and 2x4Rx reciver was significant at about 3 dB

Apple: In Rel-18 we defined UE capabilities for simplified and baseline receiver. Since MU-MIMO and ICI are not separate features, how do those capabilities map?

Qualcomm: What is meant by”how do those capabilities map?”

CTC: In Rel-18 we defined requirements for two types of receivers. For this work item, if the gap is large we should define two requirements. If the gap is small, perhaps one set of requirements can be defined for both types of UE’s. We need to cover both types of UE’s.

MediaTek: We expect to have different types of requirements for the baseline and simplified receiver. The gap in performance depends on the rank.

Huawei: We would like to keep open the possibility for a single requirement for both receiver types. We propose to come back to PDSCH, but CSI reporting requirement should be treated separately with regard to the possibility of having a single or separate sets of requirements for the difference UE architectures.

Nokia: We can wait until simulation results are available. We can make the decision at that point in time.

Qualcomm: Don’t disagree with Nokia. Rel-15 and Rel-16 UE’s optionally support MU-MIMO and ICI, not mandatory. Do we really need to specify for the simplified receiver.

Apple: MU-MIMO and ICI introduced in Rel-17 was agreed to be release independent back to Rel-15/16 up to UE declaration. From Rel-17, it is mandatory. We still have two receiver assumptions for 8Rx UE.

Qualcomm: If we have two sets of requirements for simplified and baseline, will we propagate these requirements to all >4Rx configurations and test cases?

MediaTek: We only discuss 8Rx now, not 6Rx. We would like to introduce baseline requirements and we can also run simulations for simplified.

ZTE: We can check interference scenarios for gap between baseline and simplified and then decide.

CMCC: We don’t need to preclude the possibility to have separate requirements or single requirements until we see simulation results.

**Issue 3-2-3: Interference profile**

Nokia: Companies were not eager to run system level simulations. How will we compare MMSE vs. MMSE-IRC at link level? This does not seem appropriate to us. The gain in MMSE vs. MMSE-IRC with greater inter-cell interference is where we will see the difference between the two receivers.

CTC: Reusing LTE parameters could be ok for most scenarios to verify the MMSE-IRC. But we would be ignoring the HPUE since it is not part of LTE power level parameters.

Ericsson: Similar view as China Telecom. LTE study already showed the performance gain of IRC. However, HPUE the interference profile would be different.

Huawei: Objective is to check the IRC behavior. This could be verified without necessarily changing the power of the interference profile.

ZTE: The WI indicates LTE profile is the starting point. We can evaluate LTE power profile first and then decide on HPUE.

Qualcomm: Why do we need to study the gain of IRC if we use the same profile? This as already demonstrated in LTE.

CMCC: We need to check the IRC behavior. We use LTE as a starting point. We encourage companies to bring system level simulations to see the full picture.

Huawei: This is a WI, not a SI. We need to check the performance, not to try to study the profile. For NR there are some differences from LTE so we do need to study the gain of IRC.

**R4-2413570 Way Forward for [112][328] NR\_demod\_Ph5**

*Type: For: Approval  
   
 Source: China Telecom*

**Abstract:**

**Decision: Approved**

### 8.17 Artificial Intelligence (AI)/Machine Learning (ML) for NR Air Interface

#### 8.17.1 General aspects

#### 8.17.2 Testability and interoperability issues for beam management

#### 8.17.3 Testability and interoperability issues for positioning accuracy enhancement

#### 8.17.4 Testability and interoperability issues for CSI compression and CSI prediction

#### 8.17.5 Moderator summary and conclusions

### 8.18 NR MIMO Phase 5

#### 8.18.1 General aspects and work plan

#### 8.18.2 UE RF requirements

#### 8.18.3 RRM core requirements

#### 8.18.4 Moderator summary and conclusions

### 8.19 Evolution of NR duplex operation: Sub-band full duplex (SBFD)

MCC: The TR 38.858 is a RAN1-led TR. RAN4 can not approve draftCRs, but can endorse it and directly submitted formal CR in RAN1 or send LS out to RAN1 for final agreement.

#### 8.19.1 General aspects (including RAN4 aspects for SBFD system parameters)

**R4-2411018 CR for Adding a summary sentence in sub-clause 12.2.1**

*Type: draftCR For: Endorsement  
 38.858 v18.1.0 CR- rev Cat: D (Rel-18)  
  
 Source: Charter Communications, Inc*

**Abstract:**

Adding at the end of sub-clause 12.2.1 this sentence: "Therefore, it is expected that new SBFD operators in AMBIT band or in C-Band will seek a fair coexistence with legacy TDD operating in CBRS band." Since RAN1 is the owner of TR 38.858, and RAN4 owns sub-clause 12.2.1, RAN4 would need to endorse this CR before an LS is going out to RAN1 for final approval.

**Decision: Endorsed**

**R4-2411019 Adding a summary sentence in sub-clause 12.2.1**

*Type: discussion For: Discussion  
 38.858 v CR- rev Cat: (Rel-18)  
  
 Source: Charter Communications, Inc*

**Abstract:**

Adding at the end of sub-clause 12.2.1 this sentence: "Therefore, it is expected that new SBFD operators in AMBIT and C-Band will seek a fair coexistence with legacy TDD operating in CBRS band." Since RAN1 owns TR 38.858 and RAN4 owns sub-clause 12.2.1, RAN4 would need to endorse this CR before an LS is going out to RAN1 for final approval.

**Decision: Noted**

**R4-2411070 Discussion on SBFD general issues**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411512 Views on general aspects for SBFD**

*Type: discussion For: Discussion  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2411637 Discussion on SBFD general aspects**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2411736 (NR\_duplex\_evo-Core) Discussion on SBFD general part**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2412080 Discussion on the subband configurations and guardbands for gNB SBFD**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412576 On general aspects for SBFD**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412721 Discussion on system parameters for SBFD BS**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412913 SBFD general aspects**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on SBFD general aspects

**Decision: Noted**

**R4-2413238 On SBFD system parameters**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

#### 8.19.2 BS RF requirements

##### 8.19.2.1 Potentially new requirements for SBFD operation for FR1 and FR2-1

**R4-2411082 Discussion on potentially new requirements for SBFD operation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411297 SBFD as a band specific feature and SBFD restrictions for bands with low channel bandwidth configurations**

*Type: discussion For: Discussion  
 Source: Charter Communications, Inc*

**Decision: Noted**

**R4-2411298 SBFD Restrictions for bands with low channel bandwidth Configurations**

*Type: discussion For: Approval  
 Source: Charter Communications, Inc*

**Decision:** The document was **withdrawn**.

**R4-2411513 Views on new requirements for SBFD**

*Type: discussion For: Discussion  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2411640 On the potentially new requirements for SBFD operation for FR1 and FR2-1**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted**

**R4-2411734 (NR\_duplex\_evo-Core) Discussion on new RF requirement for SBFD**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2412577 On potentially new requirements for SBFD**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412722 Discussion on potentially new requirements for SBFD operation**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412914 Potentially new SBFD BS RF requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on potentially new requirements for SBFD

**Decision: Noted**

**R4-2413237 On potentially new BS RF requirements for SBFD operation**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

##### 8.19.2.2 Modification of existing Tx requirements for FR1 and FR2-1

**R4-2411080 Discussion on modification of existing Tx requirements for SBFD operation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411514 Views on existing Tx BS RF requirements for SBFD**

*Type: discussion For: Discussion  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2411638 On the modification of existing TX requirements for SBFD-capable BS**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted**

**R4-2411737 (NR\_duplex\_evo-Core) Discussion on existing Tx requirements for SBFD**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2412723 Discussion on modification of existing Tx requirements for FR1 and FR2-1 for SBFD BS**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412915 Impact on SBFD BS RF TX requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on impact on existing BS RF TX requirements for SBFD

**Decision: Noted**

**R4-2413236 On existing BS RF TX requirements for SBFD operation**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

**R4-2413283 On modification of existing TX RF requirements for SBFD**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

##### 8.19.2.3 Modification of existing Rx requirements for FR1 and FR2-1

**R4-2411081 Discussion on modification of existing Rx requirements for SBFD operation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411083 SBFD in-band blocking and dynamic range simulation results**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411515 Views on existing Rx BS RF requirements for SBFD**

*Type: discussion For: Discussion  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2411639 On the modification of existing RX requirements for SBFD-capable BS**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted**

**R4-2411723 SBFD/TDD coexistence receiver in-band blocking**

*Type: discussion For: Discussion  
 Source: CableLabs, Charter Communications*

**Decision: Noted**

**R4-2411735 (NR\_duplex\_evo-Core) Discussion on existing Rx requirements for SBFD**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2412724 Discussion on modification of existing Rx requirements for FR1 and FR2-1 for SBFD BS**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412916 Impact on SBFD BS RF RX requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on impact on existing BS RF RX requirements for SBFD

**Decision: Noted**

**R4-2413235 On existing BS RF RX requirements for SBFD operation**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Noted**

**R4-2413284 On modification of existing RX RF requirements for SBFD**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

#### 8.19.3 RRM core requirements

#### 8.19.4 Moderator summary and conclusions

**R4-2413407 Topic summary for [112][307] NR\_duplex\_evo\_General**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

[112] BDaT Session AI 8.19.1, 8.19.2, 8.19.2.1

**Decision: Noted**

##### Issue 1-2-2: SCS support for SBFD

Samsung: We would not like to restrict to 30 KHz for FR1 and 120 kHz for FR2. 20 MHz channel bandwidth may still be possible.

ZTE: For current FR1 high bands and FR2 bands, the proposal is valid. From a specification perspective, however, we don’t need such limitations. We have 20 and 30 MHz available close to 2 GHz. 15 kHz SCS could still be a good candidate.

CMCC: Similar view as ZTE. We should not preclude the 15 kHz SCS for FR1

Qualcomm: Similar concern as Samsung.

CATT: We also want to have the flexibility.

Ericsson: The main reason to exclude 15 kHz and 60 kHz, the demodulation requiremesnts are for FDD bands. Our intention is not to exclude other SCS, but we would like to have one set of parameters for which we can complete the requirements.

Nokia: Similar view as Ericsson. We would like to agree on some typical values. We do not intend to preclude anything.

ZTE: We need to understand how to define the core requirement. If we remove some bandwidths, this means SBFD would not support such bandwidths. We have enough time to complete all of the requirements for all the SCS and bandwidths. We don’t need to downselect to two typical values at this time.

Qualcomm: Same view as ZTE

Nokia: We would like to enable progress in this WI by being able to focus on a couple of SCS.

Ericsson: If many channel bandwidths are supported, the workload could be very high. We can include other SCS based on operator request.

ZTE: We don’t see the workload issue. The only issue is UL FRC, the guard band is declaration based.

Samsung: No reason to preclude now.

##### Issue 1-2-3: Transmission bandwidth configuration NRB for SBFD

ZTE: The proposal corresponds to DL sub-band size. We need the UL sub-band size and corresponding FRC.

Qualcomm: Our understanding is this is for the DL sub-band size.

ZTE: We need to understand the purpose before we can decide what is the transmission bandwidth configuration.

CATT: If we have new sub-band bandwidths that are different from the existing channel bandwidths, then we may need new NRB values, but otherwise we can use the existing NRB and the guardband can be declared by the vendor.

Samsung: For the interpretation that transmission bandwidth same as channel bandwidth, we still need to introduce the concept of sub-band bandwidth. For the interpation of same as DL sub-band bandwidth,

Nokia: The transmission bandwidth should be the DL sub-band. Our concern is the flexibility introduces too many configurations that we won’t have time to specify them all.

ZTE: Although RAN1 allows single RB resolution, RAN4 can define requirements for discrete set of sub-band bandwidths.

CATT: We need to understand the testing differences for UE which needs many configurations tested compaed to basestation where many are declaration based. We suggest following a BS approach where for example only 10 and 20 MHz would be tested.

Ericsson: If we need to define NRB parameter for UL sub-band, do we need a new TR to capture those results including simulations?

**R4-2413507 Ad-hoc meeting minutes for [112][307] NR\_duplex\_evo\_General**

*Type: For: Information  
   
 Source: Samsung*

**Abstract:**

**Decision: Noted**

Charter: We would like to expand the discussion of the X value. If the operator owns 4x10 MHz channels, then he can still have SBFD on the band even for X=20. Because X is in square bracket, we would like to consider a larger value of X, say 40 – 50 MHz.

Nokia: For 20 MHz, we would have a small UL sub-band so not very feasible for SBFD. So we think 50 MHz is more reasonable.

ZTE: Can X be applicable to both WA and LA? For LA, it is not needed. 20 MHz is a compromise value to minimize impact to current TDD bands.

Samsung: We do not intend to rule out a band or bandwidth, but we just don’t define the requirement. We can collect more views from operators in the next meeting.

### Sub-topic 2-5: Transmitter signal quality

ZTE: We prefer to have joint measurement for SBFD and non-SBFD symbols for more averaging and smoother measurement.

Huawei: Agree with Ericsson and Nokia to have separate measurement. Joint measurement introduces additional complexity.

CATT: We are also not sure about joint measurement. The total power of SBFD and non-SBFD may be different and therefore PA configuration may be different.

### Sub-topic 3-4: In-band blocking

Huawei: MCL is proposed because this is BS to BS, where the two are fixed, so there is no need for Monte Carlo simulation. The simulation results are highly dependent on grid shift. We can consider both MCL and simulation to derive the requirement.

Samsung: Option 2 doesn’t take much work since results are already available. We are also open to option 1 so we can keep both options on the table.

Nokia: We already have understanding of coexistence study so we’d like to avoid future discussions about what is valid and what is not if we also introduce an MCL method.

ZTE: RAN4 is contribution driven.

Nokia: For grid shift, we think 10% is worst case and the other options are not likely deployed.

Qualcomm: We are not sure that 10% is the likely deployment. We should use what was agreed in the SI.

ZTE: We should keep the options open. 10% grid shift could result in a very large in-band blocking requirement that is infeasible for implementation. We would like to enable FR1 WA BS.

CableLabs: We would like to downselect to 1 or 2 options to keep the simulation effort manageable. The grid shift is often less than 10%.

Samsung: We would like to include 100% grid shift as an option.

CMCC: Agree with Samsung

Nokia: We should not define requirements to enable an implementation, but rather to have a system that works in the field.

Qualcomm: As a starting point, we should check the baseline assumption from the SI.

ZTE: We expect for FR1, there will be channel specific filtering. We expect in-band blocking level to be handled similar to out-of-band blocking due to channel filtering.

**R4-2413408 Topic summary for [112][308] NR\_duplex\_evo\_BSRF**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[112] BDaT Session AI 8.19.2.2, 8.19.2.3

**Decision: Noted**

**R4-2413513 Draft LS to RAN1 on clarification of section 12.2.1 of TR 38.858**

*Type: For: Approval  
   
 Source: Charter Communications, Inc.*

**Abstract:**

**Decision: Approved**

**R4-2413514 Way Forward for [112][307] NR\_duplex\_evo\_General**

*Type: For: Approval  
   
 Source: Samsung*

**Abstract:**

**Decision: Approved**

**R4-2413515 Way Forward for [112][308] NR\_duplex\_evo\_BSRF**

*Type: For: Approval  
   
 Source: Huawei*

**Abstract:**

**Decision: Approved**

### 8.20 Study on solutions for Ambient IoT (Internet of Things) in NR

MCC: This ia a RAN1-led SID. The TR 38.769 is under RAN1 control as it is a RAN1-led TR and all TPs that are approved in RAN4 need to be sent to RAN1 for including it into their TR 38.769.

#### 8.20.1 General aspects

#### 8.20.2 Co-existence study for ambient IoT and NR/LTE

##### 8.20.2.1 Deployment scenarios and spectrum usage

##### 8.20.2.2 Co-existence evaluations

#### 8.20.3 RF requirement impact

##### 8.20.3.1 Ambient IoT BS

##### 8.20.3.2 Ambient IoT device

##### 8.20.3.3 Intermediate note (UE)

#### 8.20.4 Moderator summary and conclusions

### 8.21 Enhancements of network energy savings for NR

#### 8.21.1 General aspects and work plan

**R4-2412508 Work plan for R19 NES**

*Type: Work Plan For: Approval  
 Source: Ericsson, Apple*

**Abstract:**

This contribution discusses the work plan for Rel-19 NES

**Decision:** The document was **not treated**.

#### 8.21.2 RRM core requirements

#### 8.21.3 Moderator summary and conclusions

### 8.22 Low-power wake-up signal and receiver for NR (LP-WUS/WUR)

#### 8.22.1 General aspects

#### 8.22.2 UE RF requirements for LP-WUS/WUR

##### 8.22.2.1 System parameters

##### 8.22.2.2 Rx requirements of REFSENS, ASCS and ACS

##### 8.22.2.3 Rx requirements of IBB, OBB, intermodulation, spurious emissions and others

##### 8.22.2.4 Testability for UE RF requirements

#### 8.22.3 BS RF requirements for LP-WUS/WUR

**R4-2411094 Further discussion on BS RF requirements for LP-WUS**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411231 Further consideration on BS RF for Rel-19 LP-WUS**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2411733 (NR\_LPWUS-Core) Discussion on LP-WUS BS RF requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted**

**R4-2411894 Discussion on BS RF requirements for LP-WUS/WUR**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412062 Discussions on LP-WUS BS RF requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412595 BS RF requirements for low-power wake-up signal for NR**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

This contribution provides proposals to progress the issues that were FFS in the agreed WF.

**Decision: Noted**

**R4-2412974 BS RF requirement overview for LP-WUS**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we provide our BS RF requirement impact.

**Decision: Noted**

#### 8.22.4 RRM core requirements for LP-WUS/WUR

##### 8.22.4.1 Simulation assumptions and results

##### 8.22.4.2 RRM core requirements

#### 8.22.5 Moderator summary and conclusions

**R4-2413409 Topic summary for [112][309] NR\_LPWUS**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[112] BDaT Session AI 8.22.3

**Decision: Noted**

**Issue 1-1: Manufacture declaration on LP-WUS**

Ericsson: Without a core minimum requirement, it would be purely based on declaration. We support proposal 1, not proposal 2.

Huawei: For the UE we have capability, but for BS it is based on declaration. We still need some kind of test based on a core requirement.

CATT: For power boosting, we need a minimum requirement to validate the declaration. Without this, we cannot determine if the feature is useful or not. The minimum level should not be challenging to implement.

ZTE: With boosting, the NR RB’s would be impacted especially for smaller bandwidths. The location of the boosted LPWUS RB’s also need to be taken into account. This depends on BS implementation and margins for emissions. There is no need to define a minimum requirement so we prefer option 1.

Nokia: This is still being discussed in RAN1 whether power boosting is useful or not. We cannot decide on the boosting level before RAN1 decides. With power boosting depending on the sequence, the PAPR could be similar to 64QAM rather than 16QAM. We cannot decide on a minimum requirement until this is understood.

CMCC: Similar view as Nokia. The mimium requirements should be larger than zero. We prefer option 1 because we don’t want to preclude smaller bandwidths, but the minimum requirement may not allow this.

Samsung: We don’t have enough information to make an agreement yet. Whether we will preclude smaller bandwidths. We should enable as many scenarios as possible. Given the available information, we prefer option 1 at this time.

CATT: Ok to defer until sufficient input from other WG’s. Zero dB is not boosting. The declaration can be made in such a way to also include the side conditions such as bandwidth.

Vivo: Can we merge option 1 and option 2? Power boosting is dependent on channel bandwidth. 3dB may be achievable for 50 MHz and above for example. One suggestion is smaller bandwidths are purely declaration based, but for larger bandwidths, also have a minimum requirement.

Huawei: LS was sent to RAN1 during SI and positive feedback was received. RAN1 is no longer discussing power boosting.

Nokia: Ability to boost is not only dependent on bandwidth, but also on the RAN1 defined sequence.

CATT: We prefer to set a threshold based on power declaration rather than bandwidth. We are ok to delay pending RAN1 decision.

Huawei: We want to see progress here. We should send an LS to RAN1 to ensure we can get an answer rather than just wait.

Ericsson: We would not like to see the requirement we define needs upgraded hardware. Because of the complexity of the WUS waveform, it would be better to have manufacturer declaration.

**Issue 1-2: Concept of LP-WUS dynamic range/power boosting**

CATT: The two options are mathematically equivalent, but EPRE is easier to specify.

Nokia: If we have more than one disjoint LPWUS signal for more than one group of UE’s within the same bandwidth, the definition is unclear. If there are no NR RB’s, then EPRE is ill defined.

Ericsson: We prefer dynamic range formulation

ZTE: EPRE is a relative value, but what we really care about is the absolute boost and how much NR power is deboosted. This is unclear from EPRE. Option 2 was agreed in the previous meeting, so we don’t see the reason to overturn the previous agreement.

Huawei: We encourage companies to check with their product teams. Product teams would tend to prefer a simpler specification given the two options are mathematically equivalent.

**Issue 1-7: Unwanted emissions**

Nokia: The dynamic range even for NR already considered emissions and EVM. So we only need to consider this. We agree with the moderator proposal.

Ericsson: Any power boosting should comply with existing emissions requirements. We don’t need new requirements. We also agree with moderator proposal.

ZTE: We are also fine to reuse legacy, but why is ACLR not included? Due to PA nonlinearity from power boost, the ACLR should also be checked.

Huawei: ACLR is for coexistence, but more important are the requirements for regulations such as SEM and spurious emisisons. If SEM and spurious can be met, we think ACLR would also be met. We don’t need to check everything.

Nokia: We want to avoid BS to declare power boosting with condition of relaxing Tx requirements such as EVM, SEM, ACLR.

Huawei: These other requirements are not related to power boosting. Power boosting is optional. The LPWUS signal is embedded in the NR signal which anyways needs to be checked.

**Issue 1-8: Transmitted signal quality**

CATT: How do we agree on whether transmitted signal quality requirement is needed before we even know the signal? We should wait until RAN1 completes the signal definition.

Huawei: OOK-1 and OOK-4 are stable in RAN1. We need to define the requirement to ensure the signal quality.

ZTE: For A-IoT, the current EVM cannot be used for OOK. We will need a different way to define EVM requirement, but we think it is needed.

**R4-2413511 Draft LS to RAN1 on power boosting for LPWUS**

*Type: For: Approval  
   
 Source: Huawei*

**Abstract:**

**Decision: Noted**

**R4-2413512 Way Forward for [112][309] NR\_LPWUS**

*Type: For: Approval  
   
 Source: Huawei*

**Abstract:**

**Decision: Approved**

### 8.23 NR mobility enhancements Phase 4

#### 8.23.1 General aspects and work plan

#### 8.23.2 RRM core requirements

#### 8.23.3 Moderator summary and conclusions

### 8.24 XR for NR Phase 3

#### 8.24.1 General aspects and work plan

#### 8.24.2 RRM core requirements

#### 8.24.3 Moderator summary and conclusions

### 8.25 Non-Terrestrial Networks (NTN) for NR Phase 3

#### 8.25.1 General aspects

**R4-2411355 Updated work plan for NR\_NTN\_Ph3**

*Type: Work Plan For: Approval  
 Source: CATT, Thales*

**Decision: Approved**

**R4-2412980 General issue for NTN RedCap**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we discuss the release independent for RedCap feature to support NTN.

**Decision: Noted**

**R4-2413353 General aspects for NTN NR Phase 3**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

On the transient time and beam swithing requirements for DL coverage enhancements (NTN beam hopping mechanisms).

**Decision: Noted**

#### 8.25.2 UE RF requirements

##### 8.25.2.1 RedCap UE RF requirements

**R4-2411069 Discussion on RF requirement for NTN RedCap UE**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2411172 On NR NTN RedCap UE RF requirements**

*Type: other For: Approval  
 Source: Apple*

**Decision: Noted**

**R4-2411496 Discussion on NTN (e)Redcap UE RF requirements**

*Type: discussion For: Discussion  
 Source: Spreadtrum Communications*

**Decision: Noted**

**R4-2411498 Discussion on UE RF requirements for NTN RedCap**

*Type: discussion For: Discussion  
 Source: Mediatek India Technology Pvt.*

**Decision: Noted**

**R4-2411539 UE RF requirement for NTN Redcap and eRedcap**

*Type: discussion For: Discussion  
 Source: Sony*

**Decision: Noted**

**R4-2411600 Discussion on RF requirement for redcap UE in FR1 NTN band.**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted**

**R4-2411657 RedCap NTN UEs**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted**

**R4-2411862 Discussion on UE RF requirements for NR NTN phase3**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412081 Discussion on RF requirements for RedCap and eRedCap UE supporting FR1-NTN in Half Duplex mode**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted**

**R4-2412607 Discussion on NTN phase3 RedCap UE RF**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2412953 Discussion on the remaining issues for Rel-19 NTN RedCap UE**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2412983 RedCap UE RF impact on HD-FDD**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our general view on the RedCap UE RF remaining issue.

**Decision: Noted**

**R4-2413142 Draft CR to TS 38.101-5: Addition of RedCap and eRedCap**

*Type: draftCR For: Endorsement  
 38.101-5 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2413526 Draft CR to TS 38.101-5: Addition of RedCap and eRedCap**

*Type: draftCR For: Endorsement  
 38.101-5 v18.6.0 CR- rev Cat: B (Rel-19)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn**

##### 8.25.2.2 Other requirements

**R4-2412981 Other NTN UE RF requirment**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our general overview on NTN UE RF impact other than Redcap.

**Decision: Noted**

**R4-2413141 NR NTN UL capacity enhancements**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

#### 8.25.3 SAN RF requirements

**R4-2411068 Discussion on transient time for SAN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted**

**R4-2412717 Discussion on RF requirements for NTN SAN in Rel-19**

*Type: discussion For: Discussion  
 Source: ZTE Corporation, Sanechips*

**Decision: Noted**

**R4-2412982 SAN RF impact overview**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our general overview on the SAN RF impact.

**Decision: Noted**

**R4-2413230 Beam switching delay aspects for DL Coverage Enhancements**

*Type: discussion For: Discussion  
 Source: Inmarsat, Viasat*

**Abstract:**

MCC: This was not made available at tdoc submission deadline.

**Decision: Noted**

**R4-2413244 Draft CR: Introduction of regenerative payload**

*Type: draftCR For: Endorsement  
 38.108 v18.3.0 CR- rev Cat: B (Rel-19)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Updated Draft CR reflecting Rel-19 regenerative payload in SAN RF specification.

**Decision: Endorsed**

#### 8.25.4 RRM core requirements

#### 8.25.5 Moderator summary and conclusions

**R4-2413410 Topic summary for [112][310] NR\_NTN\_Ph3\_General\_SAN\_RF**

*Type: other For: Information  
 Source: Moderator (Thales)*

**Abstract:**

[112] BDaT Session AI 8.25.1, 8.25.3

**Decision: Noted**

**Issue 1-1-1: “Transient time” and CP size**

Ericsson: Transient time is for PA ON/OFF. What does transient mean for beam switching?

Thales: Can consider issue 1-1-3, which indicates worst case beam switching is 100ns

Ericsson: The 100ns is based on pre-configuration, so just switching. For us, we consider switching to include the loading of coefficients based on indication from BS. Our estimate is 10us.

Thales: Worst case for analog beam switching is 100ns based on pre-configuration.

Ericsson: If preconfigured, we agree the delay could be reduced.

Ericsson: CP duration is not the only consideration since the transient may occur in a different time than the CP

ESA: Everything is preconfigured and the beam switching would occur during the CP

**Issue 1-1-3: Working hypothesis for DL coverage enhancements/beam hopping**

Ericsson: We are ok with working assumption. If RAN1 defines traffic based dynamic beamforming, we may have to reconsider the preconfiguration assumption.

**R4-2413411 Topic summary for [112][311] NR\_NTN\_Ph3\_UE\_RF**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

[112] BDaT Session AI 8.25.2, 8.25.2.1, 8.25.2.2

**Decision: Noted**

### Issue 1-1: PC3 output power for HD-FDD (e)RedCap

MediaTek: We prefer to increae max output power because the nominal output power is expectdd to be larger and therefore there is less margin to the upper bound (i.e., 23 dBm + 2 dB) over PVT

Apple: For TN redcap we also have HD-FDD operation but did not increase the output power for that case. Is it really necessary here? Would it be mandatory for HD-FDD? Or capability based?

MediaTek: The PA delivers 27.5 dB at output, but the FE loss is 0.8 dB less for HD-FDD. To accommodate, the PA was lowered which suffers from efficiency. While this efficiency loss may be acceptable for TN, for NTN it is not.

Sony: We understand the proposal, but we cannot accept to change this long standing requirement. Many Tx requirements could be impacted. A higher power class could be a better solution.

Qualcomm: Our preference is to align with TN and not to increase the output power. Implementation should be made to meet the requirements, not the other way around. There may be regulatory issues in some countries when exceeding 23 dB as well.

MediaTek: Another solution could be to increase the nominal as we have suggested, but another way is to increase the upper tolerance on max output power.

Apple: We also prefer to retain the nominal max output power as 23 dBm. Increasing the upper tolerance could be considered. Or we can wait for the PC2 definition, since there is overlap between the lower tolerance of PC2 and upper tolerance of PC3.

MediaTek: We would have the same problem with PC2 since the FE loss is also going to be 0.8 dB less.

CHTTL: We prefer not to modify the max output power. Increasing the upper power tolerance could be further studied.

Qualcomm: We would not like to increase the tolerances since this would allow larger variation. Additionally, there are some countries with regulations limiting to 25 dBm.

MediaTek: We propose to keep 23 dBm max output power but to increase the upper limit in square bracket. Specifically, 23 dBm + [2.8 dB] / -2 dB. Need further study on regulations.

Sony: Too premature to put 2.8 dB even in square bracket

Qualcomm: We suggest 23 dBm +/- 2dB as starting point, but do not preclude further discussion on upper limit.

MediaTek: How about 23 dBm +[2 to 2.8] dB / -2 dB?

### Issue 1-2: HD-FDD refsens for 2 Rx

Nokia: The value of 0.5 dB is coming from a 10 year old discussion. Perhaps we can do a bit better now, say 0.8 dB

Sony: Our logic was based on what was done for TN redcap. There is also a band dependence. We strongly prefer to align with TN. We expect implementation would reuse front-end for TN and NTN. This would help lower device costs.

Nokia: The reason is valid for n256 which is the same as TN, but there is no comparable for n254.

Ericsson: We referred to TDD refsens whcn deriving HD-FDD for TN. For NTN we don’t have TDD band. Considering the NTN link budget, we may consider tightening the refsens. For n255, we can still tighten by 0.5 db, but we can compromise to 0.2 dB as proposed by MTK.

Apple: Agree with Sony and Ericsson on the background. For refsens, we used a -100 dBm for 5 MHz channel bandwidth as the baseline and derived other bandwidths by scaling. We prefer to keep this baseline rather than tighten by 0.x dB.

Qualcomm: If we exceed TDD bands, we are setting the most stringent requirement for what is expected to be the simplest UE RedCap HD-FDD.

Nokia: We can do something better now.

Sony: The UL is the bottleneck for coverage, so tightening refsens will not be helpful. From UE implementation perspective, this may require redesign of FE for RedCap NTN device. This would increase cost and delay time to market.

MediaTek: Can we decouple the band discussion?

### Issue 1-4: Simultaneuous operation with GNSS

Sony: This issue has already been brought up. GNSS cannot operate simultaneously with NR NTN for some bands due to small separation.

MediaTek: We also observed this issue.

Huawei: It is an issue for RAN4. UE needs GNSS for precompensation.

Nokia: There are gaps allowed for GNSS measurement. The problem has already been solved.

Qualcomm: We need to check whether the issue really exists. Does simultaneous operation mean exact time instant? Or can UE figure out its own location with sufficient accuracy. This is not specific to RedCap. Could have impact from Rel-17. We suggest to decouple the GNSS issue from this RedCap NTN WI and treat it under maintenance more generally.

Thales: If there is a problem, it should be discussed per band since it is band specific. We see this as an implementation problem.

**R4-2413517 Way Forward for [112][310] NR\_NTN\_Ph3\_General\_SAN\_RF**

*Type: For: Approval  
   
 Source: Thales*

**Abstract:**

**Decision: Approved**

**R4-2413527 Way Forward for [112][311] NR\_NTN\_Ph3\_UE\_RF**

*Type: For: Approval  
   
 Source: Qualcomm*

**Abstract:**

**Decision: Approved**

### 8.26 Non-Terrestrial Networks (NTN) for Internet of Things (IoT) Phase 3

#### 8.26.1 General aspects and work plan

**R4-2411470 Work Plan for Rel-19 IoT NTN**

*Type: Work Plan For: Approval  
 Source: MediaTek inc.*

**Decision: Revised to R4-2413529 (from R4-2411470)**

**R4-2413529 Work Plan for Rel-19 IoT NTN**

*Type: Work Plan For: Approval  
 Source: MediaTek inc.*

**Decision: Approved**

#### 8.26.2 RF core requirements

**R4-2411471 Discussion on RF requirement impact for IoT NTN phase 3**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2412992 IoT NTN UE RF impact**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Noted**

**R4-2413143 NTN IoT UL capacity enhancements**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

#### 8.26.3 RRM core requirements

#### 8.26.4 Moderator summary and conclusions

**R4-2413416 Topic summary for [112][316] IoT\_NTN\_Ph3**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

[112] BDaT Session AI 8.26.1, 8.26.2

**Decision: Noted**

#### **Issue 2-1-1:** **UE RF requirement impact for NPUSCH with OCC feature**

Ericsson delegate was not available. Companies believe there is no impact to UE RF specifications from OCC, but check with Ericsson offline.

**Issue 2-1-2: UE RF requirement impact for NPRACH with OCC feature**

MTK: Ok to wait for RAN1 progress

#### **Issue 2-2-1: SAN RF requirement impact for NPUSCH/NPRACH with OCC feature**

MTK: Ok with proposal 2 since there is expected impact to SAN RF

**R4-2413530 Way Forward for [112][316] IoT\_NTN\_Ph3**

*Type: For: Approval  
   
 Source: MediaTek*

**Abstract:**

**Decision: Approved**

## 9 Liaison output to other groups and related issues

The following guidance are provided for maintenance work under AI 4 ~ AI 5:

‒ For maintenance agenda AI 4 (Rel-15/16/17) and AI 5 (Rel-18), formal CRs are expected and multiple CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

‒ When submitting contributions to AI 4, AI 5.2, AI 5.34, please add (WI\_code) in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

‒ When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a draft CR with TEI as WI code, please inform session chair.

‒ For all the endorsed draft CRs in this bis meeting, please re-submit them in the next ordinary meeting.

‒ The contributions corresponding to incoming LS for Rel-15/16/17 are expected to be submitted in AI 9.

‒ The contributions corresponding to incoming LS for Rel-18/19 are expected to be submitted to (sub-) agenda dedicated to the individual WIs. If there is no dedicated agenda, please submit to AI 5.2 or AI 5.34 depending on whether it is spectrum related topic or non-spectrum related topic.

### 9.1 R17 related

### 9.2 R15, R16 related

### 9.3 Moderator summary and conclusions

## 10 RAN task and other topics

### 10.1 Specification quality improvement (RP-240782)

It is expected to focus on identifying the key issues. No CR or draft CR is expected for TS 38.101-1/-2/-3. The draft CR for TS 38.133 can be submitted according to the work split for offline discussion only. No need to propose an SI to capture the agreements.

#### 10.1.1 UE RF specifications TS 38.101-1/-2/-3

##### 10.1.1.1 Technical wording ambiguities and Table modifications

##### 10.1.1.2 Work practice enhancements

##### 10.1.1.3 Larger specification structure enhancementsf

#### 10.1.2 RRM specification TS 38.133

##### 10.1.2.1 Specification improvement in R19 timeframe

##### 10.1.2.2 CR handling

### 10.2 Solution to enable HPUE maximum transmit power in downlink CA with single UL transmission (RP-241625)

The tdocs under this agenda won’t be treated in the first round and the way forward after offline discussions can be treated in the 2nd round

## 11 New or revised WID/SID

## 12 Any other business

## 13 Close of the meeting

The RAN4 Chair Xizeng Dai (Huawei) formally closed the RAN4#112 meeting on Friday, 23/08/2024 at 16h30.

Report prepared by: MCC