**3GPP TSG-RAN WG4 Meeting # 110BIS R4-2405254**

**Changsha, China, 15th – 19th April, 2024**

**Agenda item:** 4.4

**Source:** Moderator (Meta Ireland)

**Title:** Topic summary for [110bis][101] R18\_UERF\_maintenance\_Part1

**Document for:** Information

# Introduction

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

In the [110][103] R18\_UERF\_maintanance\_Part1, RAN4 treat the contributions for Rel-18 maintenance for LTE and NR which were already closed WIs in Rel-18.

Candidate targets are listed as follows.

* Topic #1: Maintenance of Spectrum related WIs in Rel-18 (Agenda Item 4.1)
  + Sub-Topic 1-1: n109 UE channel BW correction in TS38.101-1 (1 Tdoc)
  + Sub-Topic 1-2: 2SUL cells with inter-band CA band combinations (1 Tdoc)
  + Sub-Topic 1-3: Release independent manners for LTE IoT\_NTN\_FDD L-/S-band (1 Tdoc)
* Topic #2: Maintenance of Non-spectrum related WIs in Rel-18 (Agenda Item 4.2.x)
  + Sub-Topic 2-1: NR Channel raster enhancement for TN (6 Tdocs)
  + Sub-Topic 2-2: NR Channel raster enhancement for NTN (3 Tdocs)
  + Sub-Topic 2-3: NR channel raster capability for RedCap (4 Tdocs)
  + Sub-Topic 2-4: NR Support for UAV (2 Tdocs)
  + Sub-Topic 2-5: Enhanced LTE Support for UAV (1 Tdocs)

# Topic #1: Maintenance of Spectrum related WIs in Rel-18

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2404179](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404179.zip) (Draft CR)  🡪 No flagging. CR can be endorsed | Apple | Title: Draft CR to 38.101-1 on corrections for n109 UE channel BW table misalignment in Table 5.3.5-1  **This is a Draft CR (Cat. F) for TS38.101-1 in Rel-18**  Reason: Supporting CBW in Table 5.3.5-1 was shift by one column to the left.  **Proposal:** Correct the supporting CBWs for n109 in Table 5.3.5-1 UE channel bandwidths which are misaligned with the table header row (shifted by one column to the left). |
| [R4-2404782](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404782.zip)  (Draft CR)  🡪 No flagging. CR can be endorsed | MediaTek India | Title: (IoT\_NTN\_FDD\_LS\_band) Draft CR to 36.307: Release independent for IoT-NTN requirements (Rel-18)  **This is a Draft CR (Cat. F) for TS36.307 in Rel-18**  Reason: Regarding new bands introduced by new Wis after WI LTE\_NBIoT\_eMTC\_NTN\_req, it is unclear whether these new bands added into Rel-18 36.102 are release independent from release 17.  **Proposal:** Sentence of “with bands specified in Rel-18 36.102” is added into the table 3A.4-1 in TS36.307. |
| [R4-2404891](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404891.zip)  (Draft CR)  🡪 No flagging. CR can be endorsed | ZTE | Title: (NR\_2SUL\_cell\_combos\_R18) Draft CR for TS 38.101-1 on two SUL cells with inter-band CA band combinations  **This is a Draft CR (Cat. F) for TS38.101-1 in Rel-18**  Reason: There is no need to include CA bandwidth class for operating SUL band combination with inter-band CA for two SUL in Table 5.2C-4. Furthermore, the cell format and border line for the supported channel bandwidths per SUL band combination with inter-band CA (two SUL cells) in Table 5.5C-5 are misaligned with other band combinations.  **Proposal:** Correct the following errors,   1. To remove CA bandwidth class for operating SUL band combination with inter-band CA for two SUL in Table 5.2C-4. 2. To re-order the SUL band combinations in Table 5.2C-4 and Table 5.5C-5. 3. To correct the cell format and border line for the two SUL cell band combinations in Table 5.5C-5. |
| [R4-2404937](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404937.zip) (pCR) | KDDI | Title: On PC3 MSD values for DC\_18\_n77A and CA\_n18-n77A in Rel-18   * **Move AI 4 to AI 5.1.1.1 and treat in [103] NR\_baskets\_Part1** |

## Open issues summary

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

### Sub-topic 1-1

*Sub-topic description:* **n109 UE channel BW correction in TS38.101-1**

*Open issues and candidate options before meeting:*

**Issue 1-1-1:** Draft CR in TS 38.101-1 to correct the n109 UE channel BW in Table 5.3.5-1

* Proposals
  + Option 1: Based on Draft CR ([R4-2404179](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404179.zip)), RAN4 can agree to update the supporting CBWs for NR band n109 in Table 5.3.5-1.
  + Option 2: TBA.
* Recommended WF
  + Option 1. Draft CR ([R4-2404179](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404179.zip)) can be endorsed.

### Sub-topic 1-2

*Sub-topic description*: **2SUL cells with inter-band CA band combinations in TS38.101-1**

*Open issues and candidate options before meeting:*

**Issue 1-2-1:** Correction CR ([R4-2404891](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404891.zip)) for 2SUL cells with inter-band CA band combinations in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2404891](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404891.zip)), RAN4 update the contents in Table 5.2C-4 and Table 5.2C-5 to consistent with other SUL band combinations i.e. remove suffix of CA bandwidth class and re-order the SUL operating band combinations.
  + Option 2: TBA.
* Recommended WF
  + Option 1. Draft CR ([R4-2404891](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110bis/Docs/R4-2404891.zip)) can be endorsed.

### Sub-topic 1-3

*Sub-topic description*: **Correction on release independent manners for LTE IoT\_NTN\_FDD L-/S-band**

*Open issues and candidate options before meeting:*

**Issue 1-3-1**: Correction CR ([R4-2404782](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404782.zip)) for the application scope in TS36.307

* Proposals
  + Option 1: Based on CR ([R4-2404782](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404782.zip)), RAN4 can update the contents with “with bands specified in Rel-18 36.102” is added into the table 3A.4-1 in TS36.307.
  + Option 2: TBA
* Recommended WF
  + Option 1. Draft CR ([R4-2404782](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404782.zip)) can be endorsed.

# Topic #2: Maintenance of Non-spectrum related WIs in Rel-18

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2404161](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404161.zip) (Discussion) | Apple | Title: Remaining issues for enhanced channel raster  **This is a discussion paper for enhanced channel raster to support new 10kHz raster in some NR operating bands in Rel-18 as mandatory or optional features.**  Proposal 1a:Introduce a new column to the tables in TS 38.101-1 and TS 38.101-5 to indicate whether the enhanced channel raster is mandatory or not for the UE side.  Proposal 1b: For the network side specifications, TS 38.104 and TS 38.108, there are no strong reasons to indicate whether the enhanced channel raster is mandatory or not because it is up to the network whether to deploy that feature.  Proposal 2a: If enhanced channel raster can be mandatory for earlier releases, we ask RAN WG4 to decide how it will be captured in earlier releases.  Proposal 2b: Rel-17 RedCap devices can follow the same RAN WG4 process on defining for which bands the enhanced channel raster is mandatory (and potentially starting from which release). |
| [R4-2404162](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404162.zip) (Draft CR)  🡪 No flagging. CR can be endorsed | Apple, T-Mobile | Title: Clarification for the mandatory support of enhanced channel raster for the TN bands  **This is a Draft (Cat. F) CR for TS38.101-1 in Rel-18**  **Reason:** In last RAN4 meeting, RAN4 concluded to support the 10kHz new channel raster as mandatory feature in some NR bands.  **Agreement:**  n  Based on discussion papers from interested operators, RAN4 can support the enhanced channel raster as mandatory feature in NR Band n1, n2, n3, n5, n25, n28, n66, n71 and n85 from Rel-18.  **Proposal:** A new column is added to Table 5.4.2.3-5 and some bands can have enhanced channel raster as the mandatory feature as below.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | NR operating band | ΔFRaster  (kHz) | Uplink  Range of NREF  (First – <Step size> – Last) | Downlink  Range of NREF  (First – <Step size> – Last) | Mandatory support | | n1 | 10 | 384000 – <2> – 396000 | 422000 – <2> – 434000 | Yes | | n2 | 10 | 370000 – <2> – 382000 | 386000 – <2> – 398000 | Yes | | n3 | 10 | 342000 – <2> – 357000 | 361000 – <2> – 376000 | Yes | | n5 | 10 | 164800 – <2> – 169800 | 173800 – <2> – 178800 | Yes | | n7 | 10 | 500000 – <2> – 514000 | 524000 – <2> – 538000 |  | | n8 | 10 | 176000 – <2> – 183000 | 185000 – <2> – 192000 |  | | n12 | 10 | 139800 – <2> – 143200 | 145800 – <2> – 149200 |  | | n13 | 10 | 155400 – <2> – 157400 | 149200 – <2> – 151200 |  | | n14 | 10 | 157600 – <2> – 159600 | 151600 – <2> – 153600 |  | | n18 | 10 | 163000 – <2> – 166000 | 172000 – <2> – 175000 |  | | n20 | 10 | 166400 – <2> – 172400 | 158200 – <2> – 164200 |  | | n24 | 10 | 325300 – <2> – 332100 | 305000 – <2> – 311800 |  | | n25 | 10 | 370000 – <2> – 383000 | 386000 – <2> – 399000 | Yes | | n26 | 10 | 162800 – <2> – 169800 | 171800 – <2> – 178800 |  | | n28 | 10 | 140600 – <2> – 149600 | 151600 – <2> – 160600 | Yes | | n29 | 10 | N/A | 143400 – <2> – 145600 |  | | n30 | 10 | 461000 – <2> – 463000 | 470000 – <2> – 472000 |  | | n34 | 10 | 402000 – <2> – 405000 | 402000 – <2> – 405000 |  | | n38 | 10 | 514000 – <2> – 524000 | 514000 – <2> – 524000 |  | | n39 | 10 | 376000 – <2> – 384000 | 376000 – <2> – 384000 |  | | n40 | 10 | 460000 – <2> – 480000 | 460000 – <2> – 480000 |  | | n50 | 10 | 286400 – <2> – 303400 | 286400 – <2> – 303400 |  | | n53 | 10 | 496700 – <2> – 499000 | 496700 – <2> – 499000 |  | | n54 | 10 | 334000 – <2> – 335000 | 334000 – <2> – 335000 |  | | n65 | 10 | 384000 – <2> – 402000 | 422000 – <2> – 440000 |  | | n66 | 10 | 342000 – <2> – 356000 | 422000 – <2> – 440000 | Yes | | n67 | 10 | N/A | 147600 – <2> – 151600 |  | | n70 | 10 | 339000 – <2> – 342000 | 399000 – <2> – 404000 |  | | n71 | 10 | 132600 – <2> – 139600 | 123400 – <2> – 130400 | Yes | | n74 | 10 | 285400 – <2> – 294000 | 295000 – <2> – 303600 |  | | n75 | 10 | N/A | 286400 – <2> – 303400 |  | | n76 | 10 | N/A | 285400 – <2> – 286400 |  | | n80 | 10 | 342000 – <2> – 357000 | N/A |  | | n81 | 10 | 176000 – <2> – 183000 | N/A |  | | n82 | 10 | 166400 – <2> – 172400 | N/A |  | | n83 | 10 | 140600 – <2> –149600 | N/A |  | | n84 | 10 | 384000 – <2> – 396000 | N/A |  | | n85 | 10 | 139600 – <2> – 143200 | 145600 – <2> – 149200 | Yes | | n86 | 10 | 342000 – <2> – 356000 | N/A |  | | n89 | 10 | 164800 – <2> – 169800 | N/A |  | | n90 | 10 | 499200 – <2> – 538000 | 499200 – <2> – 538000 |  | | n91 | 10 | 166400 – <2> – 172400 | 285400 – <2> – 286400 |  | | n92 | 10 | 166400 – <2> – 172400 | 286400 – <2> – 303400 |  | | n93 | 10 | 176000 – <2> – 183000 | 285400 – <2> – 286400 |  | | n94 | 10 | 176000 – <2> – 183000 | 286400 – <2> – 303400 |  | | n95 | 10 | 402000 – <2> – 405000 | N/A |  | | n97 | 10 | 460000 – <2> – 480000 | N/A |  | | n98 | 10 | 376000 – <2> – 384000 | N/A |  | | n99 | 10 | 325300 – <2> – 332100 | N/A |  | | n100 | 10 | 174880 – <2> – 176000 | 183880 – <2> – 185000 |  | | n101 | 10 | 380000 – <2> – 382000 | 380000 – <2> – 382000 |  | | n105 | 10 | 132600 – <2> – 140600 | 122400 – <2> – 130400 |  | | NOTE 1: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. These channel numbers shall also be such that the minimum guard band for each channel bandwidth and SCS specified in Table 5.3.3-1 are met for carriers located at the upper or lower edge of an operating band. | | | |  | |
| [R4-2404380](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404380.zip) (Discussion) | TM-US and Telstra | Title: Request for mandatory enhanced channel raster for n26  **This is a discussion paper for enhanced channel raster to support new 10kHz raster for n26 as following obseravation and proposal.**  Observation 1: 25 and 30 MHz were added for n26, but there are legacy UEs that only support up to 20 MHz in this band.  Observation 2: In order to support the configuration of overlapping 25 and 20 MHz channels in 25 MHz of n26, it will be necessary for UEs to support the 10 kHz raster in n26.  Observation 3: With the 10 kHz raster, the center of channel bandwidths can be offset by increments of 180 kHz, providing flexibility for overlapping channels.  **Proposal: Include NR bands n26 as a band where the 10 kHz enhanced raster is mandatory.** |
| [R4-2404612](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404612.zip) (Discussion)  This is related draft CR ([R4-2404162](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404162.zip), Apple) for supporting of enhanced channel rater for TN band. | China Telecom | Title: Supporting of enhanced channel raster  **This is a discussion paper for enhanced channel raster to support new 10kHz raster with explicit Note as follow**   |  |  |  |  | | --- | --- | --- | --- | | NR operating band | ΔFRaster  (kHz) | Uplink  Range of NREF  (First – <Step size> – Last) | Downlink  Range of NREF  (First – <Step size> – Last) | | n11 | 10 | 384000 – <2> – 396000 | 422000 – <2> – 434000 | | … | … | … | … | | Note 1: mandatory support of enhanced channel raster is required for this band. | | | |   Proposal 1: Introduce a note to the table to indicate whether the enhanced channel raster is mandatory or not.  Proposal 2: If enhanced channel raster can be mandatory for earlier releases, we propose to capture it in spec in release independent way. |
| [R4-2405415](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405415.zip) (Draft CR)  🡪 flagging by Apple and Nokia | Huawei | Title: (NR\_channel\_raster\_enh-Core) Enhanced Channel raster for CA in TS38.101-1  **This is a Draft (Cat. F) CR for TS38.101-1 in Rel-18**  **Reason:** it is agreed that the enhanced channel raster is not applicable to intra-band contiguous CA. It is not captured in the specification. Otherwise, the definition for CA spacing need to be updated to include the enhanced channel raster.  **Proposal:** Add Note 2 in Table 5.4.2.3-5: Applicable NR-ARFCN for enhanced channel raster in TS38.101-1.  NOTE 2: The enhanced channel raster is only applicable to single carrier operation. |
| [R4-2405416](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405416.zip) (Draft CR)  🡪 flagging by Apple and Nokia | Huawei | Title: (NR\_channel\_raster\_enh-Core) Enhanced Channel raster for CA in TS38.104  **This is a Draft (Cat. F) CR for TS38.104 in Rel-18**  **Reason:** it is agreed that the enhanced channel raster is not applicable to intra-band contiguous CA. It is not captured in the specification. Otherwise, the definition for CA spacing need to be updated to include the enhanced channel raster.  **Proposal:** Add Note 2 in Table 5.4.2.3-4: Applicable NR-ARFCN for enhanced channel raster in TS38.104.  NOTE 2: The enhanced channel raster is only applicable to single carrier operation. |
| [R4-2404163](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404163.zip) (Draft CR)  🡪 No flagging. CR can be endorsed | Apple, Ligado Networks, Inmarsat, Viasat, Globalstar, Thales, Hughes/Echostar, Omnispace, Terrestar | Title: Clarification for the mandatory support of enhanced channel raster for the NTN bands  **This is Draft CR (Cat. F) in TS38.101-5 in Rel-18**  **How to apply the new 10kHz channel raster in NTN FR1 bands as n254, n255 and n256.**  Table 5.4.2.3-2: Applicable NR-ARFCN per operating band   |  |  |  |  |  | | --- | --- | --- | --- | --- | | NTN satellite operating band | ΔFRaster  (kHz) | Uplink  Range of NREF  (First – <Step size> – Last) | Downlink  Range of NREF  (First – <Step size> – Last) | Mandatory support | | n256 | 10 | 396000 – <2> – 402000 | 434000 – <2> – 440000 | Yes | | n255 | 10 | 325300 – <2> – 332100 | 305000 – <2> – 311800 | Yes | | n254 | 10 | 322000 – <2> – 325300 | 496700 – <2> – 500000 | Yes | | NOTE: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. These channel numbers shall also be such that the minimum guard band for each channel bandwidth and SCS specified in Table 5.3.3-1 are met for carriers located at the upper or lower edge of an operating band. | | | | | | |
| [R4-2405417](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405417.zip) (Draft CR)  🡪 flagging by Apple and Nokia | Huawei | Title: (NR\_channel\_raster\_enh-Core) Enhanced Channel raster for CA in TS38.101-5  **This is a Draft (Cat. F) CR for TS38.101-5 in Rel-18**  **Reason:** it is agreed that the enhanced channel raster is not applicable to intra-band contiguous CA. It is not captured in the specification. Otherwise, the definition for CA spacing need to be updated to include the enhanced channel raster.  **Proposal:** Add Note 2 in Table 5.4.2.3-2: Applicable NR-ARFCN for enhanced channel raster in TS38.101-5.  NOTE 2: The enhanced channel raster is only applicable to single carrier operation. |
| [R4-2405418](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405418.zip) (Draft CR)  🡪 flagging by Apple and Nokia | Huawei | Title: (NR\_channel\_raster\_enh-Core) Enhanced Channel raster for CA in TS38.108  **This is a Draft (Cat. F) CR for TS38.108 in Rel-18**  **Reason:** it is agreed that the enhanced channel raster is not applicable to intra-band contiguous CA. It is not captured in the specification. Otherwise, the definition for CA spacing need to be updated to include the enhanced channel raster.  **Proposal:** Add Note 2 in Table 5.4.2.3-2: Applicable NR-ARFCN for enhanced channel raster in TS38.108.  NOTE 2: The enhanced channel raster is only applicable to single carrier operation. |
| [R4-2404676](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404676.zip) (Discussion) | CMCC | Title: Discussion on mandatory of enhanced channel raster  **This is a discussion paper for enhanced channel raster to support new 10kHz raster for All RedCap UEs as follow:**  **Proposal: It is proposed that enhanced channel raster is mandatory for RedCap UEs.** |
| [R4-2405660](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405660.zip) (Discussion) | Nokia | Title: Enhanced channel raster UE capability  **This is a discussion paper for enhanced channel raster how to apply in specification and whether to apply for RedCap device of the enhanced channel raster.**  ***Observation 1: Mandatory bands can be specified in a new column of the NR ARFCN table for the enhanced channel raster. UE types (such as RedCap) shall be clarified if the mandatory requirement is not the same among different UE types.***  ***Observation 2: It was not discussed in Rel-17 RedCap WI whether the UE specific channel bandwidth is signaled from the network to explicitly indicate the position of the filter bandwidth when the system bandwidth (SIB1) is wider than 20 MHz.***  ***Proposal 1: It is requested for UE vendors to clarify if their Rel-17 RedCap UE implementations can support the configuration that requires UE channel filter off the 100 kHz raster, for the case that there is a UE specific CHBW signaled off the 100 kHz raster as well as for the case that no UE specific CHBW is signaled.***  ***Proposal 2: If Rel-17 RedCap UE has any restriction regarding the channel filter placement within the system bandwidth, it shall be clarified in TS 38.101-1*** |
| [R4-2405419](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405419.zip) (Discussion) | Huawei | Title: UE capability for Redcap UE  **This is a discussion paper for enhanced channel raster to support new 10kHz raster for RedCap UEs as follow**  For Redcap UE, RAN4 can also allow as mandatory feature with UE capability signalling for All Rel-18 UEs for certain bands.  **Proposal**: it is proposed to remove FFS for RedCap UE in the RAN4 feature list. And RAN4 can also allow as mandatory feature with UE capability signalling for All Rel-18 UEs and Rel-18 Redcap UEs for certain bands. |
| [R4-2405609](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405609.zip) (Discussion) | Qualcomm | Title: Enhanced Channel Raster Capabilities for RedCap UEs  **This is discussion paper for enhanced channel raster of RedCap UE**  Observation 1: Mandating the support of the enhanced channel raster from Rel-17 is too late.  Observation 2: Not having a UE capability for the enhanced channel raster will create interoperability issues in the field when the network configures a UE with some parameters it does not support.  **Proposal 1: For RedCap UEs, support of the enhanced channel raster should be made mandatory for the same set of bands as for eMBB UEs(as agreed in RAN4#110).**  **Proposal 2: The same UE capability framework(capability for band) should be kept for RedCap UEs.** |
| [R4-2405746](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405746.zip) (Discussion) | Nokia | Title: On the introduction of aerial Pmax in the specification  **This is a Discussion paper to define Aerial Pmax for NR UAV with the aerial UE specific NS. Also.**   1. Introduce clause 6.2K.4 for an aerial to determine the configured transmit power, following these principles:    1. In this Release only PC3 aerial UE are considered.    2. Reuse the procedure described in the legacy clause 6.2.4 to determine UE configured power.    3. If *NR-NS-PmaxValueAerial-r18* is configured, the UE applies *additionalPmax-r18* if present, otherwise, the UE applies the value defined by p-Max IE.       * The aerial UE shall not apply *additionalPmax* provided in the legacy *NR-NS-PmaxValue* if *NR-NS-PmaxValueAerial* is configured (do not mix up parameters from different elements) |
| [R4-2405747](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405747.zip) (Draft CR)  🡪 No flagging. CR can be endorsed | Nokia | Title: (NR\_UAV) DraftCR to 38.101-1 on Aerial Specific Pmax Values  **This is a Cat. F Draft CR for TS38.101-1 in Rel-18**  **Reason:** This CR contents are proposed based on the discussion paper [R4-2405746](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405746.zip) and approved reply LS in R4-2403830  **Proposal:**   1. New subclause added (6.2K.4) to include the determination of UE confiured power for aerial UEs 2. Remove duplicated text from clause 6.2K.3.1 3. Remove square brackets from Table 6.2K.3.1-1  6.2K.4 Configured transmitted power for Aerial UE For the Aerial UE, the requirements in clause 6.2.4 apply with the following modifications:   * only requirements related to Power Class 3 UEs are applicable for Aerial UEs. In the current Release Aerial UEs that are not PC3 are not considered; and * when *NR-NS-PmaxValueAerial* is configured for the applicable operating band, the UE shall not consider the value of the *additionalPmax* of the *NR-NS-PmaxList IE*. In such case, the value of *additionalPmax* to be considered is the one related to *NR-NS-PmaxValueAerial*, when configured, according to TS 38.331[7]; and * when determining the parameters in the formulas used to calculate the UE configured transmitted power, use clause 6.2K.3 for A-MPR determination instead of clause 6.2.3, whenever *frequencyBandListAerial* is configured for the operating band.   Note: When the aerial UE is not configured with *NR-NS-PmaxValueAerial* the determination of whether to use and which value to use for *additionalPmax* shall be performed as described in clause 6.2.4. |
| [R4-2405748](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405748.zip) (Draft CR)  🡪 No flagging. CR can be endorsed | Nokia | Title: DraftCR to 36.101 on Aerial Specific Pmax Values  **This is a Cat. F Draft CR for TS36.101 in Rel-18**  **Reason:** This CR contents are proposed based on the discussion paper [R4-2405746](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405746.zip) and approved reply LS in R4-2403830  **Proposal:** New subclause added (6.2.5K) to include the determination of UE confiured power for aerial UEs 6.2.5K Configured transmitted power for Aerial UE For the Aerial UE, the requirements in clause 6.2.5 apply with the following modifications:   * only requirements related to Power Class 3 UEs are applicable for Aerial UEs. In the current Release Aerial UEs that are not PC3 are not considered; and * when *NS-PmaxListAerial* is configured for the applicable operating band, the UE shall not consider the value of the *additionalPmax* in the *NS-PmaxList IE*. In such case, the value of *additionalPmax* to be considered is the one related to *NS-PmaxListAerial*, when configured, according to TS 36.331[7]; and * when determining the parameters in the formulas used to calculate the UE configured transmitted power, use clauses 6.2.3K and 6.2.4K in substituion to clauses 6.2.3 and 6.2.4, when UE is configured with *NR-NS-PmaxValueAerial*.for the operating band   Note: when UE is not configured with *NS-PmaxListAerial* for the operating band, the UE shall use the values of the *additionalPmax* in the NS-PmaxList IE, if configured, as described in clause 6.2.5 |

## Open issues summary

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

### Sub-topic 2-1

*Sub-topic description:* **NR Channel raster enhancement for TN**

*Open issues and candidate options before meeting:*

**Issue 2-1-1:** New channel raster table format to distinguish mandatory or optional feature in TS38.101-1

* Proposals
  + Option 1: Based on draft CR ([R4-2404162](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404162.zip), Apple, TM-US), RAN4 can add the new column in the NR ARFCN for enhanced channel raster Table to clarify which bands will support as the mandatory feature in TS38.101-1.
  + Option 2: Based on discussion paper ([R4-2404612](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404612.zip), China Telecom), RAN4 can add the Note to clarify which bands will support as the mandatory feature in TS38.101-1
* Recommended WF
  + In nwm flagging process, there was no flagging on the Draft CR of Apple for the table format with new column way. 🡪 Check with Option 1 for agreements.

**Issue 2-1-2:** NR operating bands for Mandatory supporting of enhanced channel raster from Operator requests

* Proposals
  + Option 1: Based on discussion papers from paper ([R4-2404380](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404380.zip), TM-US, Telstra), RAN4 can support the enhanced channel raster as mandatory feature in NR Band n26 in TN operation.
  + Option 2: Other option is not precluded.
* Recommended WF
  + Check with Option 1 for agreements.

**Issue 2-1-3:** CR on update for enhanced channel raster for intra-band CA in TS38.101-1

* Proposals
  + Option 1:Based on CR ([R4-2405415](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405415.zip), Huawei), RAN4 can add the additional Note 2 in Table 5.4.2.3-5 for NR ARFCN of enhanced channel raster.
  + Option 2: Other option is not precluded.
* Recommended WF
  + 🡪 flagging by Apple and Nokia for adding the Note 2 to restricted the enhanced channel raster for intra-band CA in TS38.101-1

**Issue 2-1-4:** CR on update for enhanced channel raster for intra-band CA in TS38.104?

* Proposals
  + Option 1: Based on CR ([R4-2405416](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405416.zip), Huawei), RAN4 can add Note 2 in Table 5.4.2.3-4 for NR ARFCN of enhanced channel raster.
  + Option 2: Other option is not precluded.
* Recommended WF
  + 🡪 flagging by Apple and Nokia for the Note 2 to restricted the enhanced channel raster for intra-band CA in TS38.104

### Sub-topic 2-2

*Sub-topic description:* **NR Channel raster enhancement for NTN**

*Open issues and candidate options before meeting:*

**Issue 2-2-1:** Correction on TS38.101-5 for Mandatory or option supporting of enhanced channel raster for NTN bands in TS38.101-5

* Proposals
  + Option 1: Based on draft CR ([R4-2404163](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2404163.zip), Apple and Ligado), RAN4 can support the enhanced channel raster in the n254, n255 and n256 NTN bands as mandatory feature within new column.
  + Option 2: TBA
* Recommended WF
  + In nwm flagging process, there was no flagging on the Draft CR of Apple for the table format with new column way. 🡪 Check with Option 1 for agreements.

**Issue 2-2-2:** CR to add the Note 2 for the enhanced channel raster for intra-band CA in TS38.101-5?

* Proposals
  + Option 1: Based on draft CR ([R4-2405417](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405417.zip), Huawei), RAN4 can add the additional Note 2 in Table 5.4.2.3-2 for NR ARFCN of enhanced channel raster in TS38.101-5.
  + Option 2: Other option is not precluded.
* Recommended WF
  + 🡪 flagging by Apple and Nokia for the Note 2 to restricted the enhanced channel raster for intra-band CA in TS38.101-5 for NTN operation.

**Issue 2-2-3:** CR to add the Note 2 for the enhanced channel raster for intra-band CA in TS38.101-8?

* Proposals
  + Option 1: Based on draft CR ([R4-2405418](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405418.zip), Huawei), RAN4 can add the additional Note 2 in Table 5.4.2.3-2 for NR ARFCN of enhanced channel raster in TS38.108.
  + Option 2: Other option is not precluded.
* Recommended WF
  + 🡪 flagging by Apple and Nokia for the Note 2 to restricted the enhanced channel raster for intra-band CA in TS38.101-5 for NTN operation.

### Sub-topic 2-3

*Sub-topic description:* **NR channel raster capability for RedCap**

*Open issues and candidate options before meeting:*

**Issue 2-3-1:** How to apply the enhanced channel raster for the RedCap UE and RedCap operating bands?

* Proposals
  + Option 1: RAN4 support the enhanced channel raster as mandatory feature for the All Redcap operating NR bands.
  + Option 2: RAN4 only support the enhanced channel raster as mandatory feature for Redcap UEs in the same set of NR operating bands for eMBB UEs.
* Recommended WF
  + In UE feature list ad-hoc session at Wednesday evening, RAN4 agreed as follow:

**- For Rel-18, at least support enhanced channel raster as mandatory feature for Redcap UEs in the same set of NR operating bands for eMBB UEs. FFS on other NR bands.**

**- For Rel-17, FFS**

**Issue 2-3-2:** Which specification release would be applied to support the enhanced channel raster for the RedCap UE as release independent manner?

* Proposals
  + Option 1: From Rel-17 ([R4-2405660](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405660.zip), Nokia), the enhanced channel raster will be supported for RedCap UEs as mandatory.
  + Option 2: From Rel-18 ([R4-2405609](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405660.zip), Qualcomm), the enhanced channel raster will be supported for RedCap UEs as mandatory with capability signalling.
  + Option3: From Rel-17 ([R4-2405419](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405419.zip), Huawei), the enhanced channel raster will be supported for RedCap UEs as optional feature with capability signalling.
    - The Rel-18 RedCap UEs will be supported as mandatory in certain bands with capability signalling.
* Recommended WF
  + **Need further discussion based on the UE feature list ad-hoc session results at Wednesday.**

**Issue 2-3-3:** Update UE feature lists of the enhance channel raster for RedCap UEs

* Proposals
  + Option 1: Based on discussion paper ([R4-2405419](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405419.zip), Huawei), RAN4 remove “FFS for RedCap”.
  + Option 2: Above issue 2-3-1 and issue 2-3-2 decision, the final UE feature lists will be updated.
  + Option3: Other option is not precluded.
* Recommended WF
  + Need to check with Option 2 as agreements. It will be updated and discussed in UE feature list in Rel-18.

### Sub-topic 2-4

*Sub-topic description:* **NR Support for UAV**

*Open issues and candidate options before meeting:*

**Issue 2-4-1:** Additional definition of Aerial UE Pmax in configured Transmitted power clause in TS38.101-1

* Proposals
  + Option 1: Based on CR ([R4-2405747](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405747.zip), Nokia), RAN4 can add new clause 6.2K.4 to define the aerial UE Pmax in the configured transmitted power in TS38.101-1.
  + Option 2: Other option is not precluded.
* Recommended WF
  + No flagging in nwm. Option 1. Draft CR ([R4-2405747](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405747.zip)) can be endorsed.

### Sub-topic 2-5

*Sub-topic description:* **Enhanced LTE Support for UAV**

*Open issues and candidate options before meeting:*

**Issue 2-5-1:** Additional definition of Aerial UE Pmax in configured Transmitted power clause in TS36.101

* Proposals
  + Option 1: Based on CR ([R4-2405748](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405748.zip), Nokia), RAN4 can add new clause 6.2.5K to define the LTE aerial UE Pmax in the configured transmitted power in TS36.101.
  + Option 2: Other option is not precluded.
* Recommended WF
  + No flagging in nwm. Option 1. Draft CR ([R4-2405748](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_110bis/Docs/R4-2405748.zip)) can be endorsed.

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