3GPP TSG-RAN WG4 Meeting # 110 R4-2401071

Athens, Greece, 26th February - 1st March 2024

**Agenda item:** 7.18

**Source:** Moderator (China Telecom)

**Title:** Topic summary for [110][112] HPUE\_Basket\_inter-CA\_SUL

**Document for:** Information

# Introduction

*List of candidate target of discussions for this topic.*

* *PC2 and PC1.5 indications in BC configuration tables*
* *TPs and draft CRs.*
* *Revised WID: new combos added.*

# Topic #1: HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Proposals / Observations** | **Company** |
| R4-2400191 | On PC2 and PC1.5 indications in BC configuration tables | Apple |
| R4-2400207 | Rel18 Cat F draft CR for 38.101-1 Add the missing harmonic mixing requirements for CA\_n7-n77 with PC2 and PC1.5 | Samsung, TELUS, Bell Mobility, Skyworks |
| R4-2400328 | Draft CR for TS38.101-1 to add new HP-NRCA combinations for FR1 | SoftBank Corp. |
| R4-2400329 | Draft CR for TS38.101-1: Addition of uplink configurations to CA\_n28-n77 | SoftBank Corp. |
| R4-2400330 | Rel-18 Cat F deafr CR for TS38.101-1: Add the missing PC2 note to HP-NRCA n3-n28-n79 | SoftBank Corp. |
| R4-2400331 | TP for TR38.899 to include new HP-NRCA combinations for FR1 | SoftBank Corp. |
| R4-2400332 | TP for TR38.899: Addition of uplink configurations to CA\_n8A-n78A | SoftBank Corp. |
| R4-2400670 | DraftCR 38.101-1 Addition of Single UL PC1.5 CA Combinations | AT&T, Bell Mobility, TELUS, Nokia, Samsung |
| R4-2400827 | (HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18) Draft CR for TS 38.101-1 to update NR inter-band CA with 2DL HPUE requirement on TDD | CMCC |
| R4-2400828 | (HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18) Draft CR for TS 38.101-1 to update NR inter-band CA with 3DL HPUE requirement on TDD | CMCC |
| R4-2400829 | (HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18) Draft CR for TS 38.101-1 to update NR SUL HPUE requirement | CMCC |
| R4-2401117 |  [HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18] Draft CR for TS 38,101-1: Addition of some PC2 CA Combinations | KDDI Corporation |
| R4-2401119 | [HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18] TP for adding 1cc UL to CA\_n28A-n41A-n77A for PC1.5 HPUE in TR 38.899 | KDDI Corporation |
| R4-2401145 | Revised WID for HPUE\_NR\_CADC\_SUL\_R18 RAN4#110 | China Telecom |
| R4-2401146 | Big CR to 38.101-1 new combinations for Rel-18 NR HPUE Inter-band | China Telecom |
| R4-2401147 | Draft CR for 38.101-1 to update note2 for NR CA configuration with 2 SUL cells | China Telecom |
| R4-2401473 | TP for 38.899 adding CA\_n78(2A) PC2 UL to CA\_n7A-n78(2A) | Ericsson, Bell Mobility, TELUS |
| R4-2401474 | TP for 38.899 adding CA\_n78(2A) PC2 UL to CA\_n66A-n78(2A) | Ericsson, Bell Mobility, TELUS |
| R4-2401475 | TP for 38.899 adding CA\_n78(2A) PC2 UL to CA\_n25A-n78(2A) | Ericsson, Bell Mobility, TELUS |
| R4-2401476 | TP for 38.899 adding CA\_n77(2A) PC2 UL to CA\_n25(2A)-n77(2A) | Ericsson, Bell Mobility, TELUS |
| R4-2401477 | draft CR 38.101-1 adding PC2 UL to 3 and 4 bands DL configurations | Ericsson, Bell Mobility, TELUS |
| R4-2401478 | TP for 38.899 adding PC2 UL to CA\_n13A-n66A-n77A | Ericsson, Bell Mobility, TELUS |
| R4-2401479 | draft CR 38.101-1 adding PC1.5 UL to 3 bands combinations | Ericsson, Bell Mobility, TELUS |
| R4-2401494 | draft CR 38.101-1 correcting NR CA 2 bands PC2 MSD table | Ericsson |
| R4-2402092 | draftCR to 38.101-1 Additions of PC2 UL n77(2A) to existing combinations | Nokia, Telus, Bell Mobility |
| R4-2402217 | TR for High power UE for FR1 NR inter-band CA/DC or NR SUL band combination with y (1<y<=6) bands DL and x (x=1, 2) bands UL and power class m (m<3) and high power on TDD band(s) | Huawei, HiSilicon, China Telecom |
| R4-2402356 | TP for TR 38.899 to include HPUE CA\_n71-n77 with UL CA\_n77(2A) | Samsung, TELUS, Bell Mobility |
| R4-2402357 | Draft CR for TS 38.101-1 to add new combinations for Rel-18 NR HPUE Inter-band | Samsung, TELUS, Bell Mobility |
| R4-2402362 | TP for HPUE CA\_n1-n28-n77 with 2UL for TR 38.899 | Samsung, KDDI Corporation, Qualcomm Incorporated, SoftBank Corp. |
| R4-2402363 | TP for HPUE CA\_n1-n41-n77 with 2UL for TR 38.899 | Samsung, KDDI Corporation, Qualcomm Incorporated, LGE |
| R4-2402437 |  [HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18] TP for inter-band 2UL to CA\_n18A-n41A-n77A for PC2 HPUE in TR 38.899 | KDDI Corporation |
| R4-2402461 | Draft CR for 38.101-1: T-Mobile USA HPUE Combinations with no MSD analysis required | T-Mobile USA |
| R4-2402462 | TP for TR38.899 for DL CA\_n77A-n85A with UL PC2 CA\_n77A-n85A and PC2 and PC1.5 UL n77 | T-Mobile USA |

## 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: PC2 and PC1.5 indications in BC configuration tables

*Open issues and candidate options before meeting:*

**Issue 1-1: Power class disparity among the highest order combination and its fallback combinations.**

* Proposal 1: For single band UL in higher order DL CA combinations, introduce a general note for 3 or more band DL CA configurations stating that “PC2 or PC1.5 for single UL can be supported if it has been specified in all the fallback combinations”.
* Proposal 2: For 2UL HPUE indication in higher order combinations, introduce a general note for 4 or more band DL CA configurations stating that “PC2 for 2-band UL can be supported if it has been specified in all the fallback combinations”.
* Recommended WF:

**Apple: the note is associated with high power UE MSD requirements. But one potential issue is for single uplink PC2 and PC1.5, when high power UE combination is proposed, it starts from lowest combination order and move up to three and four bands for DL combination. There is always time gap between 2 and 3/4 bands. Sometimes for some reason, either proponents do not want to or forget to propose. Some higher order combinations are missing. We are proposing a generic note.**

**Huawei: We understand the motivation. It can save time for CR preparation. On the other hand, it may cause confusion. Reader outside 3GPP has to check if the fallback is completed or not. To avoid confusion, we need some effort for standard people to do the checking. We would like to maintain the current the approach with note.**

**Samsung: support Apple two proposals for single CC uplink operation. For two uplink band operation, when downlink is over the full band, there is no MSD issue. Only configuration with Tib and Rib is needed. We want to save time. It does not preclude any effort to specify the higher order.**

**Verizon: Even those higher order combinations are not included in the WID, we can also have them. We support Apple and need common agreement.**

**CHTTL: we also understand Huawei concern. If we encourage information of general, we lose the visibility. Maybe we need consider readability.**

**T-Mobile USA: Similar view as CHTTL. Huawei made the point. On the other hand, we think it is useful to have spec not to prevent UE vendors to implement them in the spec.**

**Qualcomm: Similar view as T-Mobile. There is value to have note. Samsung pointed that there is no real work to do.**

**AT&T: aligned with Qualcomm and T-Mobile comments. Give UE vendor to flexibility to implement.**

**Tentative Agreement:**

* **RAN4 has the common understanding that the specifications do not prevent UE vendors to implement the higher order combinations for PC2 and PC1.5, even if they are not explicitly introduced in the RAN4 specifications**
	+ **The 2 band and 3 band combinations should be specified for PC3, PC2 and PC1.5 first.**

**Issue 1-2: Power class disparity for the same UL configurations among inter-band with intra-band CA combinations of the same constituent bands DL configurations.**

* Proposal 1: RAN4 to discuss whether the same inter-band combination with higher-order intra-band DL configurations can inherit the same UL power classes as with the lowest order combination.

**CHTTL: similar comment like the previous issues. I wonder if self interference does not hit on the main carrier but on the adjacent carrier without looking at all the cases.**

**Issue 1-3: Inconsistent handling between CA and EN-DC .**

* Proposal 1: RAN4 to discuss whether aligning the handling of the HPUE notes between CA and EN-DC is necessary.

CHTTL: Not easy to align. There are fundamental differences between tables.

### Sub-topic 2: TPs and Darft CRs

**Issue 2-1: TPs and Draft CRs.**

* Proposal: go through CRs one by one
* Recommended WF:

### Sub-topic 1: Revised WID

*Sub-topic description: Adding to WI new combos requested by AT&T, BT plc, KDDI, NBNCo, Softbank, Telstra and T-Mobile USA.*

*Open issues and candidate options before meeting:*

**Issue 1-1: Revised WID: new combos added.**

* Proposal: this could be for email approval.
* Recommended WF: