3GPP TSG-RAN WG1 Meeting #112bis-e Tdoc R1- 23xxxxx

E-meeting, April 17th – 26th, 2023

Agenda Item: 9.18

Source: Moderator (Ericsson)

Title: Summary of Email discussion on Rel-18 RRC parameters for LS to RAN2/RAN3

Document for: Discussion, Decision

# 1 Introduction

This document summarizes the discussions in input contributions and during RAN1#112bis-e under the following email thread assigned by RAN1 Chair:

[112bis-e-R18-RRC-01] Email discussion on RRC signalling by April 26 – Sorour (Ericsson)

* For eDSS, NCR, MC-Enh, BWP without restriction (details in RP-230805), and endorsed TEI proposals

The WoW described in Appendix is used for coordinating the activities under this email discussion. Companies are encouraged to follow the WoW for discussion and exchanging views.

# 2 Discussion

## 2.1 RRC parameter lists of Rel-18 WIs

The sub-sections below are organized for collection of comments on RRC parameters per WI. Please provide you comments, if any, for the input RRC list of a WI in the corresponding sub-section using the **latest version of Excelsheet** available at folder [Collection of RRC parameters](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_112b-e/Inbox/drafts/9.18%28Other%29/%5B112b-e-R18-RRC%5D/Collection%20of%20RRC%20parameters/draft_Rel-18_higher_layers_parameters_list%20-%20v000.xlsx).

Please note that the grayed-out sub-sections are not activated for discussion at this meeting.

### 2.1.1 NCR (WI code: NR\_netcon\_repeater-Core)

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| **Please see [1] for information provided by Rapporteur/Moderator of this WI.** **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| NTT DOCOMO  | **Row 54 “maxNumberOfFields”:** We suggest modification on the description as below. It should be the “number of time resource fields” indicated in DCI rather than “maximum number”.* Indicates the ~~maximum~~ number of time resource fields in one DCI carrying aperiodic beam indication.
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| Huawei, HiSilicon | Firstly, for aperiodic indication, at least the row #31, #27, and #54 should be revised. Based on the agreements, the required number of {slot offset, starting symbol, duration} is very large, e.g., 1575 for a duration of 14 OFDM symbols, and 6090 for a duration of 28 OFDM symbols, which are much larger than the agreed maximum list size of 112. The current agreed numbers will pose strong constraints on the configuration and indication of gNB, and make aperiodic beam indication hard to be used in practice. Thus, we propose the following revisions: ***Row#27, Column #K***: SEQUENCE{ ~~ncr-AperiodicFwdTimeResourceId,~~SIZE (1.. maxSlotOffsetAperiodic) of slotOffsetAperiodic, SIZE (1..maxNrofAperiodicFwdTimeResource)) OF {symbolOffset, durationInSymbols} }***Row#31, Column #K***: INTEGER(1..~~28~~ 14)***Row#54***: the newly added field “maxNumberOfFields” can be deleted since it is duplicated with the revised Row#27.Secondly, the parameters for periodic and semi-persistent can be configured in a unified way since the fields are almost the same.  |
| Intel  | **For row 54,** we share similar view with Docomo that this parameter is to indicate the number of time resource fields in a DCI, so we can delete ‘maximum’. For value range of this parameter, up to 16 can be considered, e.g., assuming maximum DCI size with 4 bits for time domain resource and 4 bits for beam index.  |

### 2.1.2 eDSS (WI code: NR\_DSS\_enh)

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| **Please see [2] for information provided by Rapporteur/Moderator of this WI.** **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| vivo | A new RRC parameter for enaling the feature of PDCCH reception on symbol with CRS is needed. According to RAN2 LS R2-2002378:

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| **5 Avoid defining functionality that has no RRC configuration but is dependent on capability bits.**The specification should not be written so that the network determines what configuration it can use for a UE implicitly by the reported UE capabilities. Instead, the gNB should always configure the UE explicitly by DL RRC signalling, respecting the reported capabilities. A problematic case in Rel-15 was the UL/DL MIMO layers, which resulted in a late-stage introduction of explicit MIMO signalling support by RAN2 (maxLayersMIMO-Indication).  |

Moreover, according to the previous discussion in the UE feature, the performance of PDCCH decoding depends on the receiver type and CE as well as the ratio of PSD of CRS and PDCCH. When the ratio is high, legacy receivers show a significant deterioration in PDCCH performance, and CE based on the clean symbol PDCCH-DMRS is preferred. when CRS PSD is low, legacy receivers have better performance. As UE has no idea of TX scheme, UE may support both CE options, and NW further indicates which one to use based on its deployment. The enabling of the R18 eDSS feature and the RRC CE indication can be grouped into a single RRC parameter, an example is as below. * If this parameter is not provided, it is considered that R18 eDSS is not enabled and UE follows legacy behavior, i.e. UE is not required to monitor the PDCCH candidate(s) overlapping with CRS.
* If this parameter is provided, it indicates that UE shall monitor the PDCCH candidate(s) overlapping with CRS, and in addition, which CE option to use. The parent IE could be PDCCH-Config.

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| pdcchOnSymbolWithLTE-CRS | UE monitor PDCCH on symbol with LTE CRS | ENUMERATED {‘legacy CE: based on all DMRS symbols’, ‘based on clean symbol only’}  | N/A | per cell | UE-specific |

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| NTT DOCOMO | * **Row 2 (lte-CRS-PatternList3) and 3 (lte-CRS-PatternList4)**: We are basically fine with row 2 and 3.

We propose to discuss RRC configuration(s) for PDCCH reception in symbols with LTE-CRS. For UE’s possible CE options (legacy CE and CE on clean symbol(s) only), gNB should inform gNB’s transmission scheme (such as puncturing or super-position transmission on REs overlapping with LTE-CRS RE) to UE so that the UE can use appropriate CE option (in case of puncturing, CE on clean symbol(s) only should be applied, while in case of super-position transmission, legacy CE could provide better performance). There is similar discussion for UE capability reporting on supported CE option(s), and even if the reporting on supported CE option(s) is not supported, gNB configuration of gNB transmission scheme or UE’s CE option (or some other form if any) can be discussed. |
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### 2.1.3 MCE (WI code: NR\_MC\_enh)

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| **Please see [3] for information provided by Rapporteur/Moderator of this WI.** **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| NTT DOCOMO (as MCE WI rapporteur) | In addition to your comment/feedback (if any) on rows in rapporteur’s initial version of RRC parameter list, please also provide your comment/feedback on companies’ proposals on other additional RRC parameters in their contributions (e.g., configurations on VRB-to-PRB mapping, PRB bundling size indicator, Frequency hopping flag, Rel-18 dynamic waveform switching, etc. for multi-cell scheduling).Based on your feedbacks by 19th UTC 9:00, I will update the RRC parameter list for MCE and upload it to [ForRapporteursUseOnly/[112b-e-R18-RRC-MCE]](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_112b-e/Inbox/drafts/9.18%28Other%29/%5B112b-e-R18-RRC%5D/ForRapporteursUseOnly/%5B112b-e-R18-RRC-MCE%5D).If there has been no comment/feedback on a row in rapporteur’s version of RRC parameter list by the deadline, I will propose to mark it as “stable”. |
| ZTE | **Issue#1:**One question for clarification regarding the following value range for BandPriority. Since both “INTEGER (0..3)” and “[TBD in RAN2]” are provided in the column, does it mean that the “INTEGER (0..3)” is just example value range and it should be decided by RAN2 in the end?If yes, we propose something like “TBD in RAN2, one example is: INTEGER (0..3)”.

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| INTEGER (0..3) [TBD in RAN2] |

Similar comments for value range for uplinkTxSwitchingOption-bandPair.**Issue#2:** It seems that at least for uplinkTxSwitchingOption-bandPair and associatedBand, RAN2 has already started their work to define the corresponding RRC signalling. Not sure whether we need to send this two in the RRC list to RAN2.We don’t have a strong view on this. If companies can reach common understanding on these two rows, we are happy to include them. However, if companies can not reach common understanding quickly, we propose to leave it to RAN2 anyway. |
| Nokia / NSB(MC-DCI only) | * **row 1** / List of set of cells:
	+ column E: The cell set list is fine, but we actually think it to be better to configure this in *PhysicalCellGroupConfig* as this
		- when configured in ServingCellConfig, there based on the current RRC parameter structure there is no option to configure separate search spaces for different set of cells scheduled by the same scheduling cell. But this is against the following agreement according to our understanding: *search space configuration of DCI format 0\_X/1\_X is independently configured for each set of cells*
		- resulting in lower RRC overhead to our understanding, as only configured once in a PUCCH cell group and not for each scheduling cell separately and no need to mention the restriction of 4 across all scheduling cells within a PUCCH cell group.
		- But this may be a bit a matter of taste here...
	+ column J: The number of set of cells could be up to 8 (for the primary and secondary PUCCH group – the limit of 4 sets is per PUCCH group to our understanding)
* **row 2 / column J**: This for a single set of cells only – i.e. should be: *Configurations ~~of~~ for a set~~(s)~~ of cells for multi-cell PDSCH/PUSCH scheduling*
* **row 5 / column K:** we thought the n\_CI could be only between 0..7. A different value range would need to be agreed or at least motivated.
* **Overall configuration for DCI format 0\_3 and 1\_3**:
	+ Clearly we don’t need to configure both of them within a set of cells. So we would be proposing some IE DCI-0-3 and DCI-1-3, where all the parameters for DCI format 0\_3 and DCI format 1\_3 would be included (so all DCI 0\_3 related RRC parameters would have DCI-0-3 as RAN2 parent IE, and DCI-0\_3 and DCI-1-3 with MC-DCI-SetofCells). But clearly, may be a matter of taste
* **row 6 & 7**: Another operation would be to have the set of cells configured (i.e. all cells applicable either for UL & DL) , and then have rows 6 & 7 to indicate (through a bitmap) which cells are then the scheduled cell set for UL & DL. But again, may be a matter of taste
* **rows 29 & 31** / column K: we have not agreed yet the table size for TDRA. We would be supporting a size of up to 8 bits.
* **For all Type 1 C** RRC parameters / 2nd line (rows 30, 32, 34, ...46)
	+ The number of cells for 0\_3 or 1\_3 goes from 2...4 cells (no support for ONLY single cell scheduling)
	+ Therefore, the value range should be *SEQUENCE (SIZE (2~~1~~..4)) OF XXX* for
* **row 30** / column K: value range should be number options -1, i.e. *SEQUENCE (SIZE (1..4)) OF INTEGER (0..maxNrofDL-Allocations - 1)*
* **row 32** / column K: same value range issues as for row 30, and should use the R16 parameter of the larger list there, i.e. *SEQUENCE (SIZE (1..4)) OF INTEGER (0..maxNrofUL-Allocations-r16 - 1)*
* **row 33** / column K: table size is 4bit 🡪 16 entries, or is there any reason to only configure 15?*SEQUENCE (SIZE (1..16~~5~~)) OF rateMatchDCI-1-3*
* **Row 35 /** column K**:** Same here up to 3bit = 8 entries – should be (1...8)
* **Row 36** / column K: the ZP-CSI triggering in 5.1.4.2 of TS 38.214 is defined as codepoint '00/01/10/11' (and not as value 0...3) and therefore a bitstring of size 2 is needed
* **Row 37 /** column K: we agreed up to 4bits – size should be (1...16)
* **Row 38** / column K: Note. In 5.1.5 of 38.214 there is a discussion about 'codepoints' so better to use a bitstring of size 3 instead of Integer (0...7)

We did not identify any missing RRC parameters (except maybe the limitations given by the configuration as part of the serving cell config commented for row 1). In general, we think we should apply the RRC parameters applicable for 0\_1 / 1\_1 as much as possible as both target eMBB operation. We don’t see a need for additional flexibility here.  |
| LGE | **Row 5:** We have similar view with Nokia that the n\_CI could be from 0 to 7. (since separate SS sets would be configured between DCI format 0\_X/1\_X and legacy DCI formats)In addition, unique n\_CI value is required only for multiple sets from a same scheduling cell. (i.e., n\_CI value can be independent (e.g. same or different) for multiple sets from different scheduling cells)**Row 6/7:** The order of cells in the list “ScheduledCell-ListDCI-1-3” and “ScheduledCell-ListDCI-0-3” is to be based on serving cell index, considering that the list is referred in 212 spec (where serving cell index order is already assumed for ordering of the DCI fields in DCI 0\_X/1\_X) as well as in 213 spec (where serving cell index based HARQ-ACK bit ordering is required as per relevant RAN1#110 agreement below).***Agreement****HARQ-ACK information bits for co-scheduled PDSCHs by a DCI format 1\_X is ordered based on serving cell indices associated with co-scheduled PDSCHs.***Row 8/9/10/11:**It is better to revise the wording “common information” as “common code-point” in case when type 1a is configured.**Row 40/44:**It is necessary to clarify whether the NUL/SUL flag is omitted (and how to assume the NUL/SUL flag if omitted). |
| Qualcomm | Below, we avoid repeating the same comments already provided from the other companies.**Row 6/7:**On column K “SEQUENCE (SIZE (2..4)) OF ServCellIndex”, does this mean a DCI 1\_3/0\_3 cannot schedule only one serving cell from the set of cells? We thought the spec allows single-cell scheduling by DCI 1\_3/0\_3.**Row 8/9/10/11:**On column J, perhaps better to just refer 38.212, rather than describing what type1a and type2 mean in the RRC parameter description.**Row 25/26/27/28:**On column P, better to capture the “otherwise” part of the agreement, so that RAN2 can understand these parameters are optional for the case when co-scheduled cell(s) is identified based on the co-scheduled cell indicator field.**Row 50:**‘config1’ seems missing in column K. |
| vivo | **MC****Issue#1: column5 nCI-Value**

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| Configure n\_CI value used for the set of cells, where unique n\_CI value is configured for each set of cells | INTEGER (1..[11])  |

As RAN1 agreed that up to 4 cell sets can be configured, it seems values 0-3 would be sufficient for nCI-Value for cell sets. In our understanding, Mc-DCI(multi-cell scheduling DCI) and sc-DCI(single-cell scheduling DCI) on the same resources must have different payload sizes. This is also reflected by the below green text in the draft CR 38.212 for MCE with the editor note(Editor’s note: There is no agreement for the following bullets, but should be straightforward to include). The reason is that, if a configuration leads to a case that mc-DCI and sc-DCI share a same size and same resource, the UE is not able to differentiate mc-DCI and sc-DCI. Either different CCEs or different payload sizes for mc-DCI and sc-DCI should be guaranteed, and thus there is no need to ensure non-overlapped n\_CI values for cell set of MCE and legacy single cell scheduling.The UE is not expected to handle a configuration that, after applying the above steps, results in …..omitted…..- the size of DCI format 0\_0 in a UE-specific search space is equal to DCI format 0\_3 in another UE-specific search space when at least one pair of the corresponding PDCCH candidates of DCI formats 0\_0 and 0\_3 are mapped to the same resource; or- the size of DCI format 1\_0 in a UE-specific search space is equal to DCI format 1\_3 in another UE-specific search space when at least one pair of the corresponding PDCCH candidates of DCI formats 1\_0 and 1\_3 are mapped to the same resource; or- the size of DCI format 0\_1 in a UE-specific search space is equal to DCI format 0\_3 in another UE-specific search space when at least one pair of the corresponding PDCCH candidates of DCI formats 0\_1 and 0\_3 are mapped to the same resource; or- the size of DCI format 1\_1 in a UE-specific search space is equal to DCI format 1\_3 in another UE-specific search space when at least one pair of the corresponding PDCCH candidates of DCI formats 1\_1 and 1\_3 are mapped to the same resource.- the size of DCI format 0\_2 in a UE-specific search space is equal to DCI format 0\_3 in another UE-specific search space when at least one pair of the corresponding PDCCH candidates of DCI formats 0\_2 and 0\_3 are mapped to the same resource; or- the size of DCI format 1\_2 in a UE-specific search space is equal to DCI format 1\_3 in another UE-specific search space when at least one pair of the corresponding PDCCH candidates of DCI formats 1\_2 and 1\_3 are mapped to the same resource.**Issue#2: DWS**We support dynamic waveform switching for multi-cell PUSCH-scheduling. Dynamic waveform switching is agreed to be carried by UL DCI for single-cell scheduling for CovEnh. And the inclusion of this field in mc-DCI can be supported and configurable. An example of the new RRC parameter indicating the presence of this field in DCI-0-3 is as below. Regarding the corresponding field type, at least for inter-band CA, a separate indication (Type2) should be supported. The details of corresponding per-serving cell IE for dynamic waveform switching are up to CovEnh.

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| dynamicWaveFormSwitchingDCI-0-3 | Configure the presence of dynamic WaveForm Switching indicator field in DCI format 0\_3 | ENUMERATED {enabled}  | N/A | per set of cells | UE-specific |

**Issue#3:** **VRB-to-PRB mapping, PRB bundling size indicator, Frequency hopping flag**All these three fields are Type1A fields that are common for all co-scheduled cells. Either reusing legacy parameters (e.g., *vrb-ToPRB-Interleaver, prb-BundlingType, frequencyHopping*) or introducing new parameters is feasible. For clarity and flexibility, new parameters are slightly preferred.**TX switching****Issue#1:** **uplinkTxSwitching-DualUL-TxState**RAN1 made some agreements on resolving the TX states ambiguity through uplinkTxSwitching-DualUL-TxState. But this parameter is not in the Excel, we are not sure if the rapporteur intended to reuse the legacy uplinkTxSwitching-DualUL-TxState, which is per CG configured, or to leave this to the RAN2 decision. |
| Xiaomi | For row 5, we agree with Nokia and LGE that 0-7 is sufficient for n\_CI because there are at most 4 sets of cells for co-scheduling. Even as mentioned by Nokia that at most 8 cell sets can be configured across different PUCCH cell groups(although we think the current description for row#2 is OK as it is from scheduling cell point of view), 0-7 is sufficient.On column K for row6/7, we share same view with Qualcomm. Although there is no agreement to support such kind of scheduling, there is no agreement to preclude it either. It seems that a MC DCI scheduling single serving cell is automatically supported. |
| Apple | **Multi-cell Scheduling****Row 6**: Similar understanding as QC that also 1 cell can be scheduled with DCI format 1\_3. Column K shall be updated as: SEQUENCE (SIZE (~~2~~1..4)) OF ServCellIndex**Row 7**: Similar understanding as QC that also 1 cell can be scheduled with DCI format 0\_3. Column K shall be updated as: SEQUENCE (SIZE (~~2~~1..4)) OF ServCellIndex**UL Tx Switching****Row 71**: A clarification whether the dynamic UL Tx switching options should include “both” also as an option. At least for Rel-16/17, for a band combination, we have switchedUL, dualUL, both as options |
| NTT DOCOMO | * **Row 5 (nCI-Value)**: In our understanding, for nCI value in search space equation, at most 8 values are configured for CCS by legacy DCI and at most 4 values are configured for multi-cell scheduling since at most 4 sets of cells can be configured for a same scheduling cell. Considering that nCI value for legacy CCS and multi-cell scheduling may not be overlapped, the possible value range on nCI value for multi-cell scheduling can be from 1 to 12.
* **Row 36/38 (ZP-CSI-DCI-1-3/ TCI-DCI-1-3)**: The definition of value range may need the discussion for clarification between integer or bitstring. In our understanding, the value range should be defined with integer since they indicate the values which is configured with integer value by higher layer (ZP-CSI-RS-ResourceSetId (INTEGER)/TCI-StateId (INTEGER)).
* **Row 40/44 (SRS-RequestDCI-1-3/** **SRS-RequestDCI-0-3)**: In our view, according to the agreement at the last RAN plenary meeting, UL/SUL indicator is omitted from MC DCI and hence UL/SUL flag is omitted as well. Therefore, the number of bits for SRS request for each cell can be assumed as 2 bits.
* **Additional RRC parameters for MC scheduling**: In our view, as captured in the current RRC parameter list, new RRC parameters, e.g., pdsch-HARQ-ACK-OneShotFeedbackDCI-1-3, pdsch-HARQ-ACK-enhType3DCI-1-3etc., can be introdused specific to DCI format 0\_3/1\_3 wihch enable the independent configuration from legacy DCI format. In addition to the current parameter list, vrb-ToPRB-InterleaverDCI-1-3 (which is referred in draft CR for 38.211), prb-BundlingTypeDCI-1-3, frequencyHoppingDCI-1-3 can be introduced as well.

In additon, new RRC parameters for dynamic waveform switching indicator can be further discussed after the clarification on whether to support the indicator in DCI format 0\_3.* **Row 69 (BandPriority)**: we are fine with ZTE’s suggestion or just describe “TBD in RAN2” for the value range. Anyway, the rapporteur’s intention to capture this row as well as other rows is to inform RAN1 intention to RAN2 since RAN1 made agreements to have such RRC parameters (although RAN2 already started the discussion on some details for the parameters based on RAN1 agreements).
* **Row 70 (associatedBand) and Row 71 (uplinkTxSwitchingOption-bandPair)**: As commented above, the rapporteur’s intention to capture these rows is to inform RAN1 intention to RAN2 since RAN1 made agreements to have such RRC parameters. Although RAN2 already started the discussion on some details for the parameters, it would be good to capture those RRC parameters as long as they are to be introduced based on RAN1 agreements.
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| OPPO | **Multi-cell Scheduling*** **Row 33**

On column K, table size is 4bit , so 16 entries can be configured, i.e.*SEQUENCE (SIZE (1..16~~5~~)) OF rateMatchDCI-1-3.** **Row 6/7:**

On column J, “Type 2” is just a naming for discussion. It’s better to align with description38.212. |

### 2.1.4 MIMO (WI code: NR\_MIMO\_evo\_DL\_UL)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.5 SL (WI code: NR\_SL\_enh2)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.6 POS (WI code: NR\_pos\_enh2)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.7 RedCap (WI code: NR\_redcap\_enh)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.8 NES (WI code: Netw\_Energy\_NR)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.9 CovEnh (WI code: NR\_cov\_enh2)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.10 UAV (WI code:NR\_UAV)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.11 XR (WI code: NR\_XR\_enh-Core)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.12 Mobility (WI code: NR\_Mob\_enh2)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.13 FR1<5MHz (WI code: NR\_FR1\_lessthan\_5MHz\_BW)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.14 BWP w/out Restriction (WI code: BWP\_wor)

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| **Please see [4] for information provided by Rapporteur/Moderator of this WI.** **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
| vivo | In the current excel sheet, only one RRC parameter which is related to Option C (i.e. NCD-SSB based measurement) is provided. We would like to raise the issue how the other two options (Option B-1-1 and B-1-2) are enabled for Rel-18 UEs. It also has dependency on the UE feature design, for example if it is allowed for a Rel-18 UE to indicate support for both Option B-1-1 and B-1-2, an explicit RRC configuration to selet between the two options will be needed. Even if the UE feature session decides to not allow a Rel-18 UE to indicate support for both Option B-1-1 and B-1-2, it would be good to reach common understanding on how to enable Option B-1-1 or B-1-2 for a given UE, and whether implicit manner would be sufficient. As one example, if a UE is capable of B-1-1 or B-1-2, if no SSB is provided in the active BWP, the UE assumes the network intention is to enable B-1-1 or B-1-2. This might work but such implicit metiond is not aligned with the RAN2 principle as expressed in their previous LS to RAN1 (R2-2002378) which discourage to design such implicit method.

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|  **5 Avoid defining functionality that has no RRC configuration but is dependent on capability bits.**The specification should not be written so that the network determines what configuration it can use for a UE implicitly by the reported UE capabilities. Instead, the gNB should always configure the UE explicitly by DL RRC signalling, respecting the reported capabilities. A problematic case in Rel-15 was the UL/DL MIMO layers, which resulted in a late-stage introduction of explicit MIMO signalling support by RAN2 (maxLayersMIMO-Indication).  |

Furthermore, similar discussion is now happening [112bis-e-AI7.1-10] to address the problem due to no explicit enable/disable of “receiving more than one PDSCH per slot” for UE.We would like to hear companies view on the above raised issues. Thanks.  |
| NTT DOCOMO | **Row 2 (nonCellDefiningSSB)**: We are fine to keep it as it also describes that “up to RAN2 to decide whether to reuse existing parameter”. |
| Intel | We share the view from vivo that for the other two features (FG 53-1 and 53-2 correspondig to Options B-1-1 and B-1-2 respectively), there should be higher layer parameters to enable it from the perspective of the gNB. This is in context of prior guidance received from RAN2 during Rel-15 late drop and is necessary regardless of whether a UE may report support of only one or both of FG 53-1 and 53-2. Thus, in addition to the higher layer parameter for NCD-SSB **in Row 2,** we would like to suggest adding two more higher layer UE-specific parameters to enable Options B-1-1 and B-1-2 on a per BWP basis. |

### 2.1.15 NR-NTN (WI code: NR\_NTN\_enh)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.16 IoT-NTN (WI code: IoT\_NTN\_enh)

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| **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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### 2.1.17 TEI (WI code: TEI18)

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| **Please see [5] for information provided by Moderator of this TEI.** **If you have any comment for a row in the Sheet corresponding to this WI, please provide your comment below by indicating the Row number.**  |
| **Company** | **Comment** |
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## 2.2 Draft LS to RAN2 on RRC parameters

A draft for LS to RAN2 is provided and available at folder [Draft LS](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_112b-e/Inbox/drafts/9.18%28Other%29/%5B112b-e-R18-RRC%5D/Draft%20LS). Please provide your comments, if any, on the **latest version of draft LS**.

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## 2.3 Improve RRC parameters preparation activity

Please consider this section to share your questions, comments and suggestions that could help to further improve our WoW within RAN1, as well as inter-action with RAN2 with respect to RRC parameter preparation. The more we know, the more we can improve. Thank You!

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# 3 Conclusion

TBD

# 4 References

1. R1-2303292 Discussion on the higher layer parameters for NCR; Rapporteur (ZTE)
2. R1-2303765 Initial higher layer parameter list for Rel18 DSS Enhancements WI; WI Rapporteur (Ericsson)
3. R1-2303739 Draft RAN1 higher layer parameters list for Rel-18 Multi-carrier enhancements for NR; NTT DOCOMO, INC.
4. R1-2303383 Preliminary Higher Layer Parameters list for BWP Without Restriction for Rel-18 NR; Vodafone Italia SpA, vivo
5. R1-2303284 On the agreed TEI proposal of 1-symbol PRS; ZTE
6. R1-2202913 Recommendations for RAN1 RRC Parameter Preparation; Moderator (Ericsson)

# 5 Appendix

The following WoW is based on the approach used in Rel-17 for coordination to prepare the RRC parameter list. The examples below are based on activities during **RAN1#112bis-e.** The same approach is going to be used in RAN1 meetings in Rel-18.

The description below is structured as the following:

* First, the structure of the folders are explained.
* Then, WoW procedures are explained in three steps.
* Finally, the instructions for updating the list at each step are explained at the end.

## 5.1 Folders Structure

The following folders are created under draft folder created in RAN1#112bis-e:

|  |
| --- |
| * **9.18 (Other)**
	+ **[112b-e-R18-RRC]**
		- **Information and Instructions**
		- **Collection of RRC parameters**
		- **Draft LS**
		- **Final output**
		- **ForRapporteursUseOnly**
			* **[112b-e-R18-RRC-NCR]**
			* **[112b-e-R18-RRC-eDSS]**
			* **[112b-e-R18-RRC-MCE]**
			* **[112b-e-R18-RRC-BWPwoRestriction]**
			* **[112b-e-R18-RRC-TEI]**
 |

The following folders are updated only by Over-all Rel-18 RRC moderator (e.g., [112bis-e-R18-RRC-01] (Ericsson (Sorour)).

* **Information and Instructions**
	+ This folder includes this document. As well as information about WI and Rapporteurs, and the template for RRC list.
* **Collection of RRC parameters**
	+ This folder is used to update and share the updated overall RRC parameter list.
* **Draft LS**
	+ This folder is used for sharing and reviewing the draft LS.
* **Final output**
	+ This folder is used to share the submitted tdocs as the outcome for this meeting.

The following folder is updated **only** by WI Rapporteur/Moderator for updating the RRC parameter list. A folder is dedicated to each WI Rapporteur/Moderator.

* **ForRapporteursUseOnly**
	+ **[112b-e-R18-RRC-NCR]**
	+ **[112b-e-R18-RRC-eDSS]**
	+ **[112b-e-R18-RRC-MCE]**
	+ **[112b-e-R18-RRC-BWPwoRestriction]**
	+ **[112b-e-R18-RRC-TEI]**
	+ **….**

The Main folder will be used for delegates’ review of the Consolidated higher layer parameters.

* **[112b-e-R18-RRC]**
	+ The Summary document for review will be provided **in this folder** to facilitate exchange views and discussions.

## 5.2 Procedures for updating the RRC list

The procedures include three steps as explained below, using the instructions for marking stable/unstable and using color-coding in the next section.

### 5.2.1 Initial step (Initial RRC list to kick-out activity):

* An Excel sheet with v000 in Collection of RRC parameters is provided by Sorour.
	+ For example: draft\_Rel-18\_higher\_layer\_parameters\_list\_v000.xls
	+ Note: In case of revision, Sorour announces the latest version to be used.
* The WI Rapporteur uses V000 (or later revision if announced) and applies the updates in the RRC parameter list, if any.
* The WI Rapporteur uses the updated RRC parameter list for submission to the meeting.
* The WI Rapporteur uploads the submitted RRC parameter list in the respective WI RRC folder as V000.
* For convenience, please include the corresponding label for the WI in Excel sheet.
	+ For example: higher\_layer\_parameters\_NCR\_v000.xls in folder [112b-e-R18-RRC-NCR]
* Note: Please see the instructions in section 5.3 for how to mark stable/unstable and use color-coding.

### 5.2.2 Intermediate step (Update and review process of RRC list):

* Review per WI phase:
	+ The WI Rapporteur has full freedom to use the dedicated WI folder for any update of the corresponding RRC parameter list based on the discussion during the meeting.
* Over-all review phase:
	+ The WI Rapporteur informs Sorour the files that Sorour can use to update the existing file in Collection of RRC parameters to the next version.
		- For example: higher\_layer\_parameters\_NCR\_v015.xls
	+ Sorour updates the overall RRC parameter list with the updates received from the WI Rapporteurs and kicks off the over-all RRC list review.
		- For example: draft\_higher\_layer\_parameters\_v001.xls
* All delegates can review and further updates are applied to the list, if needed using [112b-e-R18-RRC] folder.
	+ The WI Rapporteur can provide additional updates if needed during this step, for example based on the comments received during the review process.
		- The WI Rapporteur can use the dedicated folder, similarly to Intermediate Step, and inform Sorour on the needed updates. The best way is to create a new version that can REPLACE the old version.
		- Note: It is crucial that Sorour and WI Rapporteurs coordinate tightly to remain in sync and avoid any inconsistently in the list.
	+ Note: Sorour consults WI Rapporteur to apply technical changes.
* Note: Please see the instructions in section 5.3 for how to mark stable/unstable and use color-coding.

### 5.2.3 Final step (LS and backlog RRC list):

* When the review is completed, Sorour uses the latest version in Collection of RRC parameters.
	+ For example: draft\_higher\_layer\_parameters\_v005.xls
* Sorour provides two files of the latest RRC parameter list:
	+ **Backlog-list:**
		- This list, includes the entries in ALL rows and will be submitted to RAN1 as backlog.
		- For example: Backlog-list = draft\_higher\_layer\_parameters\_v005.xls
	+ **Output-list:**
		- This list, includes only entries in rows that are STABLE and can be sent to RAN2/RAN3. If this list is endorsed by Chair, a draft LS in Draft LS folder is prepared by Sorour to be reviewed for sending the RRC list to RAN2/RAN3.
	+ Note: Output-list is sub-set of Backlog-list. Output-list is RAN1 official output. Backlog-list is RAN1 backlog for continuation of work, if needed.
* **Sorour submits the following from Final Output folder:**
	+ LS including Output-list (Official output to RAN2/RAN3)
	+ Backlog-list (For RAN1 use only)
	+ Summary of discussion (For information)
* This Backlog-list is used in the next meeting as “The Excel sheet with v000 in Collection of RRC parameters to be provided by Sorour” for the Initial Step.
* Note: Please see the instructions in section 5.3 for how to mark stable/unstable and use color-coding.

## 5.3 Instructions for updating the entries in the RRC list:

The description below is based on the approach used in Rel-17 is used for coordination and regular update of RRC parameter list:

**Important note:** Please consider the Recommendation guidelines provided in [R1-2202913](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Docs/R1-2202913.zip).

It is beneficial to consider only stable (not necessarily complete) RRC parameters in the LS to RAN2/RAN3 (please see motivations in [R1-2202913](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Docs/R1-2202913.zip)). The remaining RRC parameters can be discussed further in RAN1 at the next meetings to be included in the earliest LS to RAN2/RAN3, when identified as stable.

**Hence, the following stable/unstable marking approach is used similarly to Rel-17:**

### 5.3.1 How to mark Stable/Unstable

* For each sheet dedicated to a WI RRC parameter list, a column at the end of the list is included for “Status”. This column is used to identify whether the content of a row in the list is stable or not by using {stable, unstable}, respectively.
	+ This column is for RAN1 information only and will not be included in the Output-list for LS to RAN2/RAN3.
* The Output-list for LS to RAN2/RAN3 includes Only the rows that are indicated as “stable”.
* The Backlog-list contains all rows and columns, including Rows indicated as unstable and the Status column, for discussion in next RAN1 meeting.
	+ The unstable rows will be discussed further in RAN1 at the next meetings to be included in the earliest LS to RAN2/RAN3 when stable.

**Important note:** Proper color-coding is crucial to properly indicate to RAN2/RAN3 the changes in the list as compared to previous version. The basic principle is as the following:

When an LS is sent to RAN2/RAN3 using the Output-list:

* The updates in the Output-list as compared to the previous lists sent to RAN2/RAN3 are shown with **blue**.
* The unchanged part of the Output-list as compared to the previous lists sent to RAN2/RAN3 are shown with **black**.

**Hence, the following color-coding approach is used similarly to Rel-17:**

### 5.3.2 How to use color coding

* **In Initial step:**
	+ Sorour: draft\_higher\_layer\_parameters\_v000.xls is based on Backlog-list from previous meeting, if any. Note that Backlog-list includes Output-list, if any.
		- All rows corresponding to Output-list in the previous LS if any, are shown in **black.**
		- The remaining rows are highlighted in yellow in **a colored font** (preferably **blue**). Note that **black is NOT** used.
	+ WI Rapporteur (e.g. NCR): higher\_layer\_parameters\_NCR\_v000.xls
		- All rows corresponding to Output-list in the previous LS are shown in **black.**
		- The remaining rows are highlighted in yellow in **a colored font** (preferably **blue**). Note that **black is NOT** used.
* **In Intermediate step:**
	+ Any text that was in Initial Step **black** and **remains unchanged**, is shown in **black.**
	+ The remaining texts are shown in **a colored font** (preferably **blue**). Note that **black is NOT** used.
* **In Final Step:**
	+ In Backlog-list, rows identified as stable, use only **black** and **blue** colors without yellow highlight.
		- Any font color except **black** is changed to **blue**.
	+ Then, Output-list is prepared using only stable rows of Backlog-list, with removing the status column.