**3GPP TSG-RAN WG4 Meeting #111 R4-24XXXXX**

**Fukuoka, Japan, 20th – 24th May, 2024**

**Agenda item:** 12.1.2

**Source:** Moderator (Apple)

**Title:** Topic summary for [111][140] RRM\_Spec\_Improvement

**Document for:** Information

# Introduction

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

In RAN4#110bis meeting, RAN4 spec quality improvement was discussed and the WF is agreed in R4-2406710

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| * In RAN4#111, it should be prioritized to identify the issues for RRM spec improvement, which are feasible to be addressed within R19 timeframe   + Interested companies are encouraged to provide their inputs and analysis. * Based on the discussion in RAN4#110bis, the following editorial aspects can be further discussed if and how to be addressed within R19 timeframe.   + Terminology/style inconsistency, incorrect notation/symbols/abbreviation, undefined abbreviations, redundant information/notes   + In the main and Annex parts: Clean up [], ‘TBD’, ‘FFS’, empty test cases   + Others are not precluded * Identified issues which are considered only to be feasible in 6G will not be further discussed under this AI. * Further discuss on how to improve the process for CR review and approval in RAN4#111. * Based on the discussion in RAN4#110bis, the following candidates of potential improvements can be further discussed   + Approve CRs only when proper use of formulas is adopted, e.g. with no FFS   + Adopt running CR approach as in other WG   + Appoint big CR/section/WI editor     - Improve coordination of maintenance CRs for on-going WIs to avoid overlap between CRs submitted by multiple companies |

# Specification improvement in R19 timeframe

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

## Companies’ contributions summary

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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2407500**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407500.zip) | Views on RRM specification quality improvement in R19 timeframe | CATT | **Proposal 1: Rapporteurs/moderators shall be responsible for limiting the scope of discussions according to the real demands from operators.**  **Proposal 2: For duplications/reuses of existing requirements and test cases, reference/citation method is beneficial to save pages; for the case where minor changes exist, reference + delta method is an effective method to avoid pages of repetitions.**  **Proposal 3: Wrong notations/symbols/abbreviations, redundant information/notes, terminology inconsistency and clear definitions for the undefined abbreviations should be resolved in the first priority in R19 timeframe.**  **Proposal 4: Define a table to clarify the definition of suffixes in Clause 3 in TS 38.133. The following table can be the starting point:**   |  |  | | --- | --- | | **Suffix** | **Clarification** | | **A** | **The requirements in the corresponding clauses are defined for CCA.** | | **B** | **The requirements in the corresponding clauses are defined for RedCap.** | | **C** | **The requirements in the corresponding clauses are defined for SAN.** | | **D** | **The requirements in the corresponding clauses are defined for ATG.** | | **…** | **The requirements in the corresponding clauses are defined for XXX.** |   **Proposal 5: To clean up brackets/TBD/FFS, apply the following steps:**  **- For brackets, remove them directly if no technical issues identified;**  **- For TBD/FFS, identify the corresponding WI and the reasons why they are left, and resolve necessary issues and remove the corner cases.** |
| [**R4-2407792**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407792.zip) | On RRM specification improvement | BeammWave | **Observation 1:** Correction of abbreviations, notations and symbols is uncontroversial, since there already are agreed lists in TS 38.133 Sections 3.1-3.3.  **Observation 2:** Adding missing definitions of abbreviations is uncontroversial, since the abbreviations already are used in the normative part of the specification.  **Observation 3:** Corrections done to the Rel-18 baseline before a Rel-19 version of TS 38.133 is created may save CR implementation work.  Based on those observations, we propose the following with CR target RAN4#112 (August):  **Proposal 1:** Corrections to abbreviations, notations and symbols, as well as adding missing definitions of abbreviations, are to be carried out within the Rel-19 timeframe and before a Rel-19 version of TS 38.133 is created. Volunteering companies provide CRs to RAN4#112 (August). MCC sets up a collaboration space, e.g. post-meeting folder, where CR drafts can be shared to allow interested companies to review and revise.  Additionally, we propose the following with CR target RAN4#114 (February) or later:  **Proposal 2:** The following improvements are to be carried out within the Rel-19 timeframe, with target on CRs at RAN4#114 (February) or later i.e. after Rel-19 version of TS 38.133 has been created: - Inconsistencies in terminology/style (within a clause as well as across clauses) - Indentation levels in nested side conditions - Removal of brackets [], TBD, and FFS  **Proposal 3:** The following improvements are to be carried out within the Rel-19 timeframe, but may need some more discussion on how to proceed: - Removal of redundant or superfluous information - Clean-up of notes |
| [**R4-2407967**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407967.zip) | Discussion on specification quality improvement for TS38.133 | LG Electronics Inc. | propose   * + ***Observation 1***: For the issues required technical discussion and consensus such as corner cases and []/TBD/FFS, it should be guaranteed to have enough time to discuss; e.g., by 2Q 2025.   + ***Observation 2***: Following issues would be less technical discussion and it can be resovled by 4Q 2024.     - Duplication for new feature or use cases, including both core/performance requirements and test cases     - Hierarchy of indent     - Terminology/style inconsistency, incorrect notation/symbols/abbreviation, undefined abbreviations, redundant information/notes     - Suffix alignment   + ***Proposal 1***: RAN4 needs to clarify the timeline for the task of speicficiation quality improvement whether this task would be completed by 4Q 2024 (first version of Rel-19 specification release) or 3Q 2025 (end of Rel-19 timeframe).   + ***Proposal 2***: Consider different target deadline for prioritized issues whether require technical discussion; issues c)~f) by 4Q 2024, and issues a) and b) by 3Q 2025.     - a) Too many corners cases with lengthy side conditions     - b) Bracket, TBD, FFS, worse in the performance part of the spec     - c) Duplication for new feature or use cases, including both core/performance requirements and test cases     - d) Hierarchy of indent     - e) Terminology/style inconsistency, incorrect notation/symbols/abbreviation, undefined abbreviations, redundant information/notes, unclear mapping between requirements and test     - f) Suffix alignment |
| [**R4-2407976**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407976.zip) | On Rel-19 RRM specification improvements | Qualcomm Incorporated | Proposal 1: Address the issue of duplication of requirements in the RRM specification with high priority starting from Rel-19.  Proposal 2: RAN4 to develop guidelines for drafting requirements with complex logic, including adopting a pseudo-code approach (e.g. similar to the way RAN2 procedures are specified). |
| [**R4-2408075**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408075.zip) | Views on specification improvement in R19 timeframe | SAMSUNG R&D INSTITUTE JAPAN | Observation 1: RRM specification exists some redundant contents with copy-paste under different places.  Proposal 1: RAN4 shall further discuss drafting rules to avoid unnecessary redundant contents documented as guidance for RRM specification drafting e.g.   * Once new features introduced into RRM specification, refer to existing requirements/sub-sections as much as possible with further description on the difference/delta compared to existing requirements.   Observation 2: The suffixes usage under 2nd level clauses are not aligned across different sections.  Proposal 2: For new features introduced in Rel-19, WI rapporteurs/moderators shall work together with spec editor to have aligned suffix usage across different sections if new suffixes introduced. Such guidance shall be provided and included into workplan before RAN4 start to CR drafting work. |
| [**R4-2408163**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408163.zip) | Specification improvements in R19 timeframe | Nokia | 1. RAN4 should initiate discussions related to specification structure aspects for 6G in parallel with the ongoing Rel-19 NR specification improvement work, in order not to waste valuable information and time. How to structure such 6G specification structure discussion and how to capture possible outcome related to 6G specification structure can be discussed further. 2. RAN4 should at least correct the indentation errors which are present many places in the current specification. 3. RAN4 should start using similar numbering approach as in RAN2 when defining Rel-19 requirements, where possible. 4. RAN4 to remove duplicated requirements and move and capture those in one existing section. This section can then be referred to from where those requirements are currently defined. 5. Any additional feature specific requirements or difference to the baseline requirements can be kept/addressed in the current sections. 6. RAN4 and interested companies can work and general enhancements of the specification by looking at alignment of abbreviations, terms, requirements, spelling errors etc. 7. Some clear guidance and planning of the work might be needed such that the number of proposed changes is still manageable for companies. |
| [**R4-2408285**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408285.zip) | Further discussion on RRM spec quality improvement | vivo | Proposal 1: In R19 time frame, following editorial changes are made for 5G specifications from Rel-15 to Rel-18.  Terminology/style inconsistency, incorrect notation/symbols/abbreviation, undefined abbreviations, redundant information/notes  In the main and Annex parts: Clean up [], ‘TBD’, ‘FFS’, empty test cases, unused test configurations  Suffix alignment  Indent improvement  Proposal 2: In R19 time frame, RAN4 works on a SI for RRM spec quality improvement and a TR to capture outcome of at least following aspects.  Specification structure organization  Requirements drafting rules and guidance  5G spec improvement on some example requirements with new approach |
| [**R4-2408306**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408306.zip) | Views on RRM specification improvement in R19 timeframe | China Telecom | Proposal 1: Generic principles on the solutions for TS 38.133 specification improvement in Rel-19 timeframe:   * Controllable and reasonable time for online discussion (e.g., based on the TU to be allocated), and not consider the specification change which requires significant amount of time for discussion. * Clear on how to implement.   Proposal 2: For the specification of the Rel-19 new features, RAN4 to consider the following solutions:   * No-use of indentation and instead using pseudo-code. * Reduce the redundancy and duplication, e.g., align the rule of adding similar requirements at least in the same WI, use differential approach (baseline + delta) for test configuration. * To better coordinate the new feature CRs and the maintenance CRs, further limit the number of maintenance CRs in the two quarters for core part and performance part completion respectively. * Include references or mapping tables in the core part requirements that point to the relevant test cases, which can be done in the maintenance phase. |
| [**R4-2409296**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409296.zip) | On issues for RRM specification quality improvement | Huawei, HiSilicon | • Proposal 1: Identify editorial issues and make correction in R19 timeframe  > Most practical improvement in R19 timeframe  > Will set up a reference for 6G specs  • Proposal 2: Setup the list of issues to be addressed  > Alignment of terminology, notation, symbols and abbreviation  > Correct use of styles and indentations  • Proposal 3: Setup the time line and work split for the correction  > Suggest to complete the work in Q3 and Q4 for core part, FFS for perf part  > Suggest to distribute the work load based on proper work split, e.g. based on clauses or types of issues  • Proposal 4: Consider to address the following non-editorial issues in R19 timeframe  > Duplication: same or similar requirements defined in different formats or wording in multiple places across the spec  > Discrepancy: different approaches for adding requirements or test cases for new feature, extending existing clauses,  creating new clauses with full requirements or creating new clauses with a reference to existing clauses  • Proposal 5: Avoid technical discussions when addressing non-editorial issues |
| [**R4-2409366**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409366.zip) | On RRM specification quality improvement | Ericsson | * ***Proposal 1:*** *Mathematical notation and symbols must be checked for consistency and aligned upon the need, at least within each clause.* * ***Proposal 2:*** *Empty test cases in Annex A of TS 38.133 from Rel-15/16 can be made void, unless there is a strong interest and the exact plan on how and when to complete them.* * ***Proposal 3:*** *For test cases in Annex A of TS 38.133, remove all square brackets for complete performance WIs.* * ***Proposal 4:*** *For test cases in Annex A of TS 38.133, some TBDs can be resolved by looking them up in the corresponding test cases in RAN5 specifications.* * ***Proposal 5****: The draft CRs with editorial corrections are prepared, based on Rel-18 38.133.* * ***Proposal 6****: Rel-18 Cat F draft CRs with more straightforward editorial corrections can be brought, e.g., to the RAN4#112 meeting in August, covering:*   + *Mathematical notations,*   + *Empty test cases for the closed performance WIs,*   + *[] and TBDs in test cases for the closed performance WIs,*   + *Missing abbreviation.* * ***Proposal 7****: RAN4 to review the use of modal verbs in normative text in requirements and make corrections as needed.* * ***Proposal 8 (general big or non-editorial changes)****: Any medium- or large-scale changes, including restructuring, to the existing NR requirements shall be avoided.* * ***Proposal 9 (general big or non-editorial changes)****: Any non-editorial changes to the existing NR requirements shall be avoided, unless really necessary for completeness of the specification or requested by RAN5, e.g., test cases clean up.* |

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

## Prioritized issues which are feasible to be addressed within R19 timeframe

* Clean up [], ‘TBD’, ‘FFS’, (LGE, CATT)
  + Q2,2025(LGE)
* Terminology/style inconsistency, incorrect notation/symbols/abbreviation, undefined abbreviations, redundant information/notes (LGE, CATT, BeammWave, Nokia, Huawei, Ericsson)
  + Q4,2024(LGE)
  + 1st priority in R19(CATT)
  + Notations/symbols/abbreviations: Before R19 version of 38.133 is created, i.e. CRs to be provided in Aug. 24. Terminology/style and Redundant information/notes: Feb.25 or later. (BeammWave)
* Hierarchy of indent (LGE, Nokia, Huawei, China Telecom)
  + Q4,2024(LGE)
  + Use RAN2-liked numbering approach (Nokia)
  + use pseudo-code for R19 new features (China Telecom)
* Suffix alignment (LGE, CATT, Samsung)
  + Q4,2024(LGE)
  + Define a table in clause 3(CATT)
  + Align suffix for new features in R19(Samsung)
* empty test cases (Ericsson)
  + Empty test cases in Annex A of TS 38.133 from Rel-15/16 can be made void (Ericsson)
* Others
  + Duplicated requirements (LGE, CATT, Qulacomm, Samsung, Nokia, Huawei, China Telecom)
    - Q4,2024(LGE)
    - Any medium- or large-scale changes, including restructuring, to the existing NR requirements shall be avoided.(Ericsson)
    - Apply to R19 new features (China Telecom)
  + Corner case (LGE)
    - Resolve by Q2,2025(LGE)
    - Any medium- or large-scale changes, including restructuring, to the existing NR requirements shall be avoided.(Ericsson)
  + Develop guideline for drafting rules (Qualcomm, Samsung)
    - Only capture the delta part from the existing requirements (Samsung)
  + Modal verbs (Ericsson)
  + Include references or mapping tables in the core part requirements that point to the relevant test cases (China Telecom)

## On how to organize the work

* New dedicated R19 SI (vivo)
* CR in TEI (BeammWave, Ericsson)
* Controllable and reasonable time for online discussion (China Telecom)

# Topic #1: On CR handling

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

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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2407501**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407501.zip) | Views on CR handling for RRM spec improvement | CATT | Proposal 1: Adopt running CR approach in RAN4 and it can only be agreed and then incorporated into spec when stable and mature enough, e.g., no FFS, consistent structures/wordings, etc.  Proposal 2: The following procedures can be considered if running CR approach is adopted:   * + Based on the WI discussion, first version of running CR is endorsed.   + Before RAN4 meeting, rapporteur/moderator re-submits the endorsed running CR with updates based on latest specification to keep them aligned.   + Delegates submit individual draft CRs based on the last endorsed running CR.   + During or after RAN4 meeting, rapporteur/moderator revises the running CR to merge the endorsed draft CRs from companies.   + Endorse/agree the revised running CR by post email approval.   Proposal 3: It is better to appoint CR editors by WI/feature basis rather than section basis. |
| [**R4-2407977**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407977.zip) | On CR process improvements in RRM | Qualcomm Incorporated | Proposal 1: RAN4 to adopt a running-CR approach for Rel-19 WI (and beyond), with the following principles:   * One company (or two at most), the editor(s), would be responsible for preparing the initial draft of the Running CR, capturing specification impact according to WI agreements obtained in previous WG meetings. * The editor(s) publish an updated version of the Running CR after each WG meeting. Interested companies review and suggest revisions to the CR during a pre-defined time period between the WG meetings. * The updated version of the Running CR is endorsed at the start of the next WG meeting. * The start time of the Running CR is left at the discretion of the WI rapporteur. RAN4 guideline would be to start at least two quarters (two plenary cycles) before submitting the formal CR for approval. * FFS whether to maintain separate Running CRs for the core and performance parts of a WI.   Proposal 2: Starting with Rel-19, RAN4 to leverage the Running CR approach for RRM maintenance for on-going or recently closed WIs.  Proposal 3: RAN4 to further discuss process improvements for handling RRM maintenance for pre-Rel-19 WIs. |
| [**R4-2408077**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408077.zip) | Views on CR handling | SAMSUNG R&D INSTITUTE JAPAN | **Observations-1: RAN4 take lots of effort on maintenance issues including maintenance CRs.**  **Proposal-1: RAN4 shall consider some measures to further control workload on maintenance including number of maintenances CRs. Some possible ways for further discussion:**   * *Strict rules for t-doc cap of maintenance CRs* * *Discourage to submit purely editorial CRs* * *Big CR approach still applied for first 2 quarters after release completion* * *Permission rules for early release maintenance CR i.e., during Rel-X time, for release-(X-2) and even earlier release maintenance issues, t-doc and CR submission shall be permitted and guided by RAN4 leadership with dedicated AIs*   **Proposal 2: For new features introduced in Rel-19, WI rapporteurs/moderators shall work together with spec editor to have aligned suffix usage across different sections if new suffixes introduced. Such guidance shall be provided and included into workplan before RAN4 start to CR drafting work**.  **Drafting CR rules for on-going WIs**  **Observation-2: Due to different situation compared to RAN1/RAN2, FFS whether “running CR approach” from other WGs can be applicable to RAN4**  **Observation-3: RAN4 already endorsed some measures on work plan, and “big drafting CR approach” in R4-2114691 (slide 2 and slide 6).**  **Proposal 3: Enforce the endorsed “the big drafting CR approach” as captured in R4-2114691(slide 6) for on-going non-spectrum WIs.**  **Proposal 4: Enforce CR drafting shall follow 3GPP drafting rules and 3GPP drafting styles in TR 21.801.** |
| [**R4-2408164**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408164.zip) | Specification improvements on CR handling | Nokia | 1. Utilizing a running CR process can in general help RAN4 specification quality by allowing draft CRs to be available earlier and allowing all companies more time to review the changes.   Utilizing a running CR process can help RAN4 improve the quality of new requirements developed in a WI by allowing companies to review the needed requirements and spot any missing ones as early as possible.   1. RAN4 to trial the running CR process in some selected Rel-19 work items. |
| [**R4-2408286**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408286.zip) | CR handling for RRM spec quality improvement | vivo | ***Proposal 1: Big CR approach is used in RAN4 for CR handling.***  ***For an ongoing WI,***  ***Big CR(s) is used and it starts at least two quarters before WI completion.***  ***Work split on draft CRs is necessary.***  ***In the last quarter or meeting for WI completion, only Big CR(s) is allowed.***  ***Rapporteur(s) or moderator(s) are responsible for the Big CR(s)***  ***For a completed WI within [two quarters],***  ***A big CR for the WI is used.***  ***Draft CRs can be brought in based on either with work split or not.***  ***For other maintenance,***  ***A big CR for single release is used.***  ***Draft CRs can be brought in based on company.*** |
| [**R4-2408307**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408307.zip) | Views on RRM CR handling | China Telecom | Proposal 1: Generic principles on the CR handling improvement approach:   * Not considerably increase the workload. * Clear on how to implement.   Observation 1: One main difference between the RAN2 running CR and RAN4 big CR approaches is without or with individual small CRs.  Proposal 2: RAN4 can discuss whether to adopt the RAN2 running CR approach on only one or few companies responsible for one or few CRs per specification per WI, i.e., without individual small CRs prepared by multiple companies.  Observation 2: Another main difference between the RAN2 running CR and RAN4 big CR approaches is to capture the agreements in (small/running) CR during the meeting week or during the post-meeting process.  Proposal 3: Given the short interval between meetings, it is not preferred to capture the agreements made in the meeting into CR in RAN4 post-meeting process.  Observation 3: There are restrictions on the time to start and complete the RAN4 CRs, i.e., the maturity of RAN4/1/2 agreements and the WI core & performance completion deadlines respectively.  Proposal 4: RAN4 to discuss feasible ways of leaving more time on CRs given that the restrictions on the start and completion time still applies in Rel-19 and onwards. For example:   * When there is no sufficient/stable agreements to be captured in the CR at earlier phase, RAN4 can first discuss the CR structure, use of example CR for similar changes to different sections, addition of abbreviation and potential interaction among different WIs. * For the meeting when the WI core or performance part is closed, identify and discuss the CR related issues even if the issues are not raised in any discussion papers. |
| [**R4-2409297**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409297.zip) | On CR handling for RRM specification quality improvement | Huawei, HiSilicon | Keep using the current big CR approach, including work split and draftCR endorsement process before  formal CR agreement, and consider the following improvement  > earlier start on CR discussion rather than the last 2 meetings  > endorse a REFERENCE CR when needed |
| [**R4-2409367**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409367.zip) | On CR handling to improve the RRM specification quality | Ericsson | * **Proposal 1**: Allocate separate AI/TU for discussing and finalizing the feature CRs after the technical discussions are over. Depending on the feature and the amount of specification impact, the time allocation can vary and can be up to the entire meeting week in the worst case. * **Proposal 2**: WI Rapporteurs present a CR implementation plan (e.g., similar to workplan but focused on CR handling for the WI), discuss, and get it approved. * **Proposal 3**: For situations where similar text needs to be repeated across multiple sections (or specifications), the general text could firstly be agreed as a reference and then used across different sections/CRs/specifications to improve consistency. * **Proposal 4**: Creating an informal checkbox list of key specification editing aspects to remember and check while preparing CRs and/or extend the Forword section of the specification to ensure consistent usage of frequently used terms, notation, abbreviation, CA configuration vocabulary, etc. * **Proposal 5**: Creating a 3GPP repository of figure templates, editable diagrams, and formulae. The link with templates could be included in the checkbox list described in Proposal 4. |

## Improvement of CR handling

* Adopt running CR approach (CATT, Qualcomm, Nokia, China Telecom)
  + for R19 WI only
  + for R18 ongoing/recently closed WI and R19 WI (Qualcomm)
  + take a trial in selected R19 WI(Nokia)
  + it can be further discussed (China Telecom)
  + Moderator: Detailed procedure are subject to further discussion once running CR approach is confirmed
* Stay with existing big CR approach with/without enhancement (Samsung,vivo, Huawei)
  + Moderator: Detailed procedure enhancement are subject to further discussion if existing big CR approach stays.