3GPP TSG-RAN WG4 Meeting #111 R4-24xxxxx

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

**Agenda item:** 7.4.5

**Source:** Moderator (Apple)

**Title:** Topic summary for [111][205] NR\_RRM\_enh3\_part1

**Document for:** Information

# Introduction

This topic summary includes RRM core requirements maintenance for FR2 SCell activation delay reduction (7.4.1) and RRM performance requirements for FR2 SCell activation delay reduction (7.4.3).

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

* Mainly discuss on
  + Issue 2-1, 2-2, 2-3, 2-4, 1-1, 1-2, 1-3, 1-4.

**Note:**

FG31-1: Enhanced L3 measurement reporting for unknown SCell activation if the valid L3 measurement results are available

FG31-2: Beam sweeping factor reduction for FR2 unknown SCell activation

FG31-3: Shorter measurement interval for unknown SCell activation

# Topic #1: Core part maintenance (7.4.1)

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

## Companies’ contributions summary

|  |  |  |
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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2407300**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407300.zip) | Apple | Proposal 1: RAN4 to discuss if measurement period shall be considered as a condition to differentiate the requirements for FR1 SCell activation enhancement with L3 report.  Proposal 2: Like the legacy FR1 known SCell activation, SCell activation delay requirement with L3 report shall be differentiated according to measurement period below or above 2400ms, and decide if AGC refinement or T/F tracking is needed. |
| [**R4-2407736**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407736.zip) | Nokia, Nokia Shanghai Bell | Proposal 1: The conditions shall be defined for FR1 and FR2 band separately, assuming “all to-be-activated SCells are on the same band”.  Proposal 2: To adopt the following conditions for multiple SCell activation delay requirement with L3 reporting:   * All to-be-activated SCells are on the same band, and * there is at least one unknown to-be-activated SCell on the band, and * there is no active serving cell or known to-be-activated SCell on the FR2 band, or there is no active serving cell or known to-be-activated SCell contiguous to the unknown SCell on the FR1 band.   Proposal 3: The above conditions shall be captured in application paragraphs.  Proposal 4: RAN4 to discuss if to consider the case where not all the unknown to-be-activated SCells are reported in the L3 reporting and cell detection is still needed on some of the unknown SCells.  Proposal 5: If the case in P4 is agreed to be discussed, N1 needs to be counted for the cell detection on the unknown SCells which were not reported and non-contiguous to any of the reported unknown SCells. |
| [**R4-2407737**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407737.zip) | Nokia, Nokia Shanghai Bell | CR on section 8.3.18 based on discussion paper 7736. Please author to check the change is made on latest Big CR R4-2407301 |
| [**R4-2407765**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407765.zip) | vivo | Proposal 1 RAN4 also consider applying enhancements of L3 reporting during SCell activation in FR1 to the case when only one SSB is transmitted in *ssb-PositionInBurst*.  Proposal 2 RAN4 further extend the requirement applicability of 8.3.17 and 8.3.18 to the scenarios in FR1 where only one SSB is considered. If only one SSB is considered, Tuncertainty\_MAC, Tuncertainty\_SP, Tuncertainty\_RRC and TRRC\_delay are counted as zero, and the 3ms MACE CE decoding delay for TCI state activation is removed, i.e. the overall delay Tactivation\_time is 7ms + TL3,report+ THARQ + TFineTiming + 2ms. |
| [**R4-2407766**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407766.zip) | vivo | CR on 8.3.2, 8.3.17, 8.3.18 based on 7765 and other technical points. Please author to check the change is made on latest Big CR R4-2407301 |
| [**R4-2408243**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408243.zip) | ZTE Corporation, Sanechips | Proposal 1: For both single and multiple SCell activation,   * From the UE perspective, UE reports valid L3 reporting for the to-be-activated SCell(s), regardless same or different measurement results. Besides the to-be-activated SCell(s), UE can decide whether and which cell(s)’ measurement results configured with servingCellMO can be reported by the way. * Form the NW perspective, if receiving the L3 reporting, NW picks the measurement results on the to-be-activated SCell(s) to accelerate the SCell activation procedure. Regarding other cells measurement results, whether and how to apply, depend on NW decision. |
| [**R4-2408261**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408261.zip) | ZTE Corporation, Sanechips | CR on 8.3.17, 8.3.18. Please author to check the change is made on latest Big CR R4-2407301 |
| [**R4-2408262**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408262.zip) | ZTE Corporation, Sanechips | CR on 8.3.2. (some change similar as CTC CR 8308). Please author to check the change is made on latest Big CR R4-2407301 |
| [**R4-2408308**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408308.zip) | China Telecom | CR on 8.3.2(some change similar as ZTE CR 8262), 8.3.18. Please author to check the change is made on latest Big CR R4-2407301 |
| [**R4-2408309**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408309.zip) | China Telecom | Proposal 1: For multiple CC activation in the same FR2 band when more than one to-be-activated SCell are configured with servingCellMO, it is up to UE implementation to report CC of SCell to be activated result or the other CC (if it is latest) or both, and after UE reports the results to NW, it is up to NW which result to be used for SCell activation. |
| [**R4-2408429**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408429.zip) | Qualcomm Incorporated | Proposal: For multiple CC activation in the same band when more than one to-be-activated SCell are configured with servingCellMO,   * Regardless of FR, UE can report measurement results for multiple to-be-activated SCell if measurements are available and valid if reportOnActivation report type is configured at corresponding MO. Results from different Cells in the same band are also valid even the results are different. It is up to NW which result to be used for SCell activation. * For FR2, UE is expected to receive one measurement and report configuration for one frequency carrier per band.   Proposal: L3 reporting based multiple SCell activation requirements for both FR1 and FR2 are applicable to unknown target SCell activation when there is no active serving cell or there is no known SCell(s) on the same band. Applicable scenario (Case1-2, Case 2-3). Otherwise, legacy requirements are applicable.  Proposal : For multiple SCell activation requirement with L3 reporting is applicable when   * All SCells are unknown and on the same band, and * There is no active serving cell on the same band, * If UE report L3 reports for all to-be-activated SCell, no spec impact. * If UE report L3 report for some to-be-activated SCell,   + Current R18 reporting based requirements are applied for to-be-activated SCells with L3 reporting   + Legacy requirements are applied after UE received TCI activation command for at least one SCell after sending L3 measurement results.     - Legacy requirements are case 1-1 for FR2 and case 2-2 for FR1. |
| [**R4-2408563**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408563.zip) | Huawei, HiSilicon | Proposal 1: The split between new clause 8.3.17 and the legacy clause 8.3.7 are suggested as follows:   * Capture the requirements for case 1-1 and case 2-1 in 8.3.18 * Case 1-2 and Case 1-3 to be referred to legacy clause with necessary clarification about N1 definition.   Proposal 2: For FR2 target SCell, the requirements can be updated as follows:  For FR2 target SCell, Tactivation\_time\_multiple\_scells is equal to Tactivation\_time which is the SCell activation delay in millisecond as specified in Clause 8.3.17 except the definition of Tuncertainty\_MAC and Tuncertainty\_RRC are replaced with:  - Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), relative to  - First valid L3-RSRP reporting of a to-be-activated SCell within the same band for unknown case, when UE reports valid L3-RSRP.  - Tuncertainty\_RRC is the time period between reception of the RRC configuration message for TCI of periodic CSI-RS for CQI reporting (when applicable) relative to  - First valid L3-RSRP reporting of a to-be-activated SCell within the same band for unknown case, when UE reports valid L3-RSRP.  Proposal 3: For FR1 target SCell, the requirements can be updated as follows:  For FR1 target SCell, Tactivation\_time\_multiple\_scells is:  - 3ms + max (4ms + [TL3 report]+ Tuncertainty\_SP + 3ms+ THARQ, max(TFirstSSB\_MAX\_multiple\_scells + TSMTC\_MAX\_multiple\_scells, 4ms + [TL3 report]+ Tuncertainty\_MAC + 3ms + THARQ) + TFineTiming + 2ms ), if the semi-persistent CSI-RS is used for CSI reporting  - 3ms + max (4ms + [TL3 report]+ Tuncertainty\_RRC + TRRC\_delay, max(TFirstSSB\_MAX\_multiple\_scells + TSMTC\_MAX\_multiple\_scells, 4ms + [TL3 report]+ Tuncertainty\_MAC + THARQ) + TFineTiming + 2ms), if the periodic CSI-RS is used for CSI reporting  if on the same band UE also has at least one parallel to-be-activated SCell which is FR1 unknown SCell without valid L3-RSRP report after SCell activation. TFirstSSB\_MAX\_multiple\_scells, TSMTC\_MAX\_multiple\_scells is defined in 8.3.7; if on the same band, UE does not have any parallel to-be-activated SCell which is FR1 unknown SCell without valid L3-RSRP report after SCell activation, requirements in 8.3.17 apply. |
| [**R4-2408564**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408564.zip) | Huawei, HiSilicon | CR on section 8.3.18 based on discussion paper 8563. |
| [**R4-2409707**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409707.zip) | Ericsson | Proposal 1: For single SCell activation, the measurement report of the to-be-activated SCell should be validate before sending to the NW.  Proposal 2: For multiple CC activation when more than one to-be-activated SCell are configured with servingCellMO, it is up to UE implementation to report CC of SCell to be activated result or the other CC (if it is latest) or both. |

*The moderator can suggest a limited number of papers which could be presented.*

## Open issues summary

*Before f2f meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

**Issue 1-1: Applicability of multiple SCell activation with L3 reporting on FR1 and FR2 band**

* Option 1 (Nokia):
  + The conditions shall be defined for FR1 and FR2 band separately, assuming “all to-be-activated SCells are on the same band”
  + To adopt the following conditions for multiple SCell activation delay requirement with L3 reporting:
    - All to-be-activated SCells are on the same band, and
    - there is at least one unknown to-be-activated SCell on the band, and
    - there is no active serving cell or known to-be-activated SCell on the FR2 band, or there is no active serving cell or known to-be-activated SCell contiguous to the unknown SCell on the FR1 band.
* Option 2 (Qualcomm):
  + L3 reporting based multiple SCell activation requirements for both FR1 and FR2 are applicable to unknown target SCell activation when there is no active serving cell or there is no known SCell(s) on the same band. Applicable scenario (Case1-2, Case 2-3 in R4-2408429). Otherwise, legacy requirements are applicable.
  + Case 1-2: No known parallel to-be-activated SCell on the same band
  + Case 2-3: There is no known SCells in the same band
* Option 3 (Huawei):
  + The split between new clause 8.3.17 and the legacy clause 8.3.7 are suggested as follows:
    - Capture the requirements for case 1-1 and case 2-1 in 8.3.18
    - Case 1-2 and Case 1-3 to be referred to legacy clause with necessary clarification about N1 definition.
  + FR1 target SCell:
    - Case 1-1: The UE has L3-RSRP after SCell activation command.
    - Case 1-2: The UE does not have L3-RSRP report but it is contiguous to a Cell with L3-RSRP report after SCell activation command.
    - Case 1-3: The UE does not have L3-RSRP report and it is not contiguous to such a Cell, but there is at least one such Cell is counted in N1.
  + FR2 target SCell:
    - Case 2-1: UE have L3-RSRP for at least one SCell in the same FR2 band.
* Recommended WF:
  + Moderator: consider using option 3 as baseline and add condition descriptions from option 1 and option 2.

**Issue 1-2: Multiple SCell activation requirement with L3 reporting based on issue 1-1**

* Option 1 (Nokia):
  + RAN4 to discuss if to consider the case where not all the unknown to-be-activated SCells are reported in the L3 reporting and cell detection is still needed on some of the unknown SCells.
    - If yes, N1 needs to be counted for the cell detection on the unknown SCells which were not reported and non-contiguous to any of the reported unknown SCells.
* Option 2 (Qualcomm):
  + For multiple SCell activation requirement with L3 reporting is applicable when
    - All SCells are unknown and on the same band, and
    - There is no active serving cell on the same band,
    - If UE report L3 reports for all to-be-activated SCell, no spec impact.
    - If UE report L3 report for some to-be-activated SCell,
      * Current R18 reporting based requirements are applied for to-be-activated SCells with L3 reporting
      * Legacy requirements are applied after UE received TCI activation command for at least one SCell after sending L3 measurement results.
        + Legacy requirements are case 1-1 for FR2 and case 2-2 for FR1.
  + Case 1-1: There is at least one parallel to-be-activated FR2 known SCell, or   
    if UE receives the SCell activation command and TCI state activation commands at the same time.
  + Case 2-2: There is known to-be activated SCell
* Option 3 (Huawei):
  + For FR2 target SCell, the requirements can be updated as follows:
    - For FR2 target SCell, Tactivation\_time\_multiple\_scells is equal to Tactivation\_time which is the SCell activation delay in millisecond as specified in Clause 8.3.17 except the definition of Tuncertainty\_MAC and Tuncertainty\_RRC are replaced with:
    - Tuncertainty\_MAC is the time period between reception of the last activation command for PDCCH TCI, PDSCH TCI (when applicable), relative to
    - First valid L3-RSRP reporting of a to-be-activated SCell within the same band for unknown case, when UE reports valid L3-RSRP.
    - Tuncertainty\_RRC is the time period between reception of the RRC configuration message for TCI of periodic CSI-RS for CQI reporting (when applicable) relative to
    - First valid L3-RSRP reporting of a to-be-activated SCell within the same band for unknown case, when UE reports valid L3-RSRP.
  + For FR1 target SCell, the requirements can be updated as follows:
    - For FR1 target SCell, Tactivation\_time\_multiple\_scells is:
    - 3ms + max (4ms + [TL3 report]+ Tuncertainty\_SP + 3ms+ THARQ, max(TFirstSSB\_MAX\_multiple\_scells + TSMTC\_MAX\_multiple\_scells, 4ms + [TL3 report]+ Tuncertainty\_MAC + 3ms + THARQ) + TFineTiming + 2ms ), if the semi-persistent CSI-RS is used for CSI reporting
    - 3ms + max (4ms + [TL3 report]+ Tuncertainty\_RRC + TRRC\_delay, max(TFirstSSB\_MAX\_multiple\_scells + TSMTC\_MAX\_multiple\_scells, 4ms + [TL3 report]+ Tuncertainty\_MAC + THARQ) + TFineTiming + 2ms), if the periodic CSI-RS is used for CSI reporting
    - if on the same band UE also has at least one parallel to-be-activated SCell which is FR1 unknown SCell without valid L3-RSRP report after SCell activation. TFirstSSB\_MAX\_multiple\_scells, TSMTC\_MAX\_multiple\_scells is defined in 8.3.7; if on the same band, UE does not have any parallel to-be-activated SCell which is FR1 unknown SCell without valid L3-RSRP report after SCell activation, requirements in 8.3.17 apply.
* Recommended WF:
  + Moderator:
    - for FR2, option 3 can be used as baseline for discussion.
    - For FR1, discuss all option 1/2/3.

**Issue 1-3: L3 reporting in multiple SCell activation**

* Proposals
  + Option 1(ZTE):
    - For both single and multiple SCell activation,
      * From the UE perspective, UE reports valid L3 reporting for the to-be-activated SCell(s), regardless same or different measurement results. Besides the to-be-activated SCell(s), UE can decide whether and which cell(s)’ measurement results configured with servingCellMO can be reported by the way.
      * Form the NW perspective, if receiving the L3 reporting, NW picks the measurement results on the to-be-activated SCell(s) to accelerate the SCell activation procedure. Regarding other cells measurement results, whether and how to apply, depend on NW decision
  + Option 2(CTC):
    - For multiple CC activation in the same FR2 band when more than one to-be-activated SCell are configured with servingCellMO, it is up to UE implementation to report CC of SCell to be activated result or the other CC (if it is latest) or both, and after UE reports the results to NW, it is up to NW which result to be used for SCell activation.
  + Option 3(QC):
    - For multiple CC activation in the same band when more than one to-be-activated SCell are configured with servingCellMO,
      * Regardless of FR, UE can report measurement results for multiple to-be-activated SCell if measurements are available and valid if reportOnActivation report type is configured at corresponding MO. Results from different Cells in the same band are also valid even the results are different. It is up to NW which result to be used for SCell activation.
      * For FR2, UE is expected to receive one measurement and report configuration for one frequency carrier per band.
  + Option 4(Ericsson):
    - For single SCell activation, the measurement report of the to-be-activated SCell should be validate before sending to the NW.
    - For multiple CC activation when more than one to-be-activated SCell are configured with servingCellMO, it is up to UE implementation to report CC of SCell to be activated result or the other CC (if it is latest) or both.
* Recommended WF
  + Moderator: to see if following option can be a compromise (use option 1 as baseline):
    - Option 5 (Moderator): For both single and multiple SCell activation,
      * From the UE perspective, UE reports valid L3 reporting for the to-be-activated SCell(s), regardless same or different measurement results. Besides the to-be-activated SCell(s), UE can decide whether and which cell(s)’ measurement results configured with servingCellMO can be reported by the way.
      * Form the NW perspective, if receiving the L3 reporting, NW picks the measurement results on the to-be-activated SCell(s) to accelerate the SCell activation procedure. Regarding other cells measurement results, whether and how to apply, depend on NW decision
      * For FR2, UE is expected to receive one measurement and report configuration for one frequency carrier per band. (similar as in option 3, but it’s general for both single and multiple SCell activation)

**Issue 1-4: Other issues related with FR1 SCell activation enhancement**

* Proposals
  + Proposal 1(Apple):
    - RAN4 to discuss if measurement period shall be considered as a condition to differentiate the requirements for FR1 SCell activation enhancement with L3 report.
    - Like the legacy FR1 known SCell activation, SCell activation delay requirement with L3 report shall be differentiated according to measurement period below or above 2400ms, and decide if AGC refinement or T/F tracking is needed.
  + Proposal 2(vivo):
    - RAN4 also consider applying enhancements of L3 reporting during SCell activation in FR1 to the case when only one SSB is transmitted in *ssb-PositionInBurst*.
    - RAN4 further extend the requirement applicability of 8.3.17 and 8.3.18 to the scenarios in FR1 where only one SSB is considered. If only one SSB is considered, Tuncertainty\_MAC, Tuncertainty\_SP, Tuncertainty\_RRC and TRRC\_delay are counted as zero, and the 3ms MACE CE decoding delay for TCI state activation is removed, i.e. the overall delay Tactivation\_time is 7ms + TL3,report+ THARQ + TFineTiming + 2ms.
* Recommended WF
  + Discuss the P1 and P2

**The CR submitted in this meeting:**

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| **CR tdoc** | **Company** | **Main revision** | **Status** | **Moderator suggestions** |
| [**R4-2407737**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407737.zip) | Nokia, Nokia Shanghai Bell | CR on section 8.3.18 based on discussion paper 7736. | To be revised | Recommend companies to coordinate the CR splitting, and have one company CR cover one section. |
| [**R4-2407766**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407766.zip) | vivo | CR on 8.3.2, 8.3.17, 8.3.18 based on 7765 and other technical points. | To be revised |
| [**R4-2408261**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408261.zip) | ZTE Corporation, Sanechips | CR on 8.3.17, 8.3.18. | To be revised |
| [**R4-2408262**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408262.zip) | ZTE Corporation, Sanechips | CR on 8.3.2. (some change similar as CTC CR 8308). | To be revised |
| [**R4-2408308**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408308.zip) | China Telecom | CR on 8.3.2(some change similar as ZTE CR 8262), 8.3.18. | To be revised |
| [**R4-2408564**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408564.zip) | Huawei, HiSilicon | CR on section 8.3.18 based on discussion paper 8563. | To be revised |

# Topic #2: RRM performance requirements for FR2 SCell activation delay reduction (7.4.3)

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

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2407358**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407358.zip) | Apple | Proposal 1: For all FG31-1 TCs, only verify the activation delay when L3 report is triggered. But if UE can report L1-RSRP earlier than the target L3 reporting time (DCI triggered PUSCH), such UE can still be treated as “pass the test” as long as it can complete the SCell activation within the delay requirement of FR2 SCell activation enhancement with FG31-1. |
| [**R4-2407738**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407738.zip) | Nokia, Nokia Shanghai Bell | Proposal 1: If DCI is scheduled within the time margin, UE is required to respond with the L3 report as long as there is a valid measurement result.  Proposal 2: The test equipment sends TCI activation command after receiving the L3 report.  Proposal 3: UE report of L1-RSRP shall not be considered as the pass condition of the FG31-1 TC. |
| [**R4-2407739**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407739.zip) | Nokia, Nokia Shanghai Bell | CR for section A7.5.3.16 based on 7738, and change A7.5.3.16 🡪 A.5.5.3.x |
| [**R4-2407767**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407767.zip) | vivo | Proposal 1 If TE is able to deal with the TCI configuration/activation based on either L3 reporting or L1 reporting whichever is earlier, the test case shall allow UE reporting L1 as one pass condition.  Proposal 2 According to core requirements, UE reporting L1 instead L3 shall complete the SCell activation within max(Tuncertainty\_MAC + TFineTiming + 2ms, Tuncertainty\_SP) after L1-RSRP is reported.  Proposal 3 Remove the square bracket on 7ms. |
| [**R4-2407768**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407768.zip) | vivo | CR on A.6.5.3.X, A.4.5.3.X (are these two TCs captured in the big CR R4-2407302 already?) |
| [**R4-2408263**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408263.zip) | ZTE Corporation, Sanechips | CR on A.6.5.3.X, A.4.5.3.X to reflect K2 |
| [**R4-2408310**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408310.zip) | China Telecom | Proposal 1: UE reporting L1 can also be a pass condition to verify the case that UE report both L3-RSRP reporting and L1-RSRP reporting before receiving TCI activation command. |
| [**R4-2408430**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408430.zip) | Qualcomm Incorporated | Proposal : UL DCI transmission for sub-test 2 is n+7ms+ THARQ.  Proposal : In sub-test1, UE consider pass if UE send L1 measurements and receive TCI activation command before UE send L3 reporting.  Proposal: The timeline is similar as legacy SCell activation TC three consecutive time (T1, T2, T3). No more optimization is needed to define additional time points. |
| [**R4-2408565**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408565.zip) | Huawei, HiSilicon | Proposal 1: For following case1, the TCI configuration is based on the L3 reporting regardless whether there is L1 reporting before n+3ms+THARQ+M, and UE shall be able to report L3 report as scheduled.   * Case 1: n+3ms+THARQ+M-k2   Proposal 2: Clarify the applicability rule that for UE supporting two PUCCH group, UE is required to pass TC#2. |
| [**R4-2408566**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408566.zip) | Huawei, HiSilicon | CR on A.5.5.3.X1, A.7.5.3.X1 and A.7.5.3.X2. based on 8565 |
| [**R4-2409708**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409708.zip) | Ericsson | Proposal 1: RAN4 to include SR transmission in the test case for L3 report based fast SCell activation test case.  Proposal 2: If UE is configured with periodic or semi-persistent CSI report, L1-RSRP report can be test passing condition, if UE do not receive UL grant before the L1-RSRP report is ready. |
| [**R4-2409709**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409709.zip) | Ericsson | CR on A.6.5.3.x, A.4.5.3.x, A.5.5.3.X1, A.7.5.3.X1, A.7.5.3.X2, A.6.5.3.x, A.4.5.3.x, A.7.5.3.16 based on 9708 |

*The moderator can suggest a limited number of papers which could be presented.*

## Open issues summary

*Before f2f meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions..*

In last RAN4#110 meeting the TC work split (R4-2403466) is agreed as following:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Feature | Index | Test case | CA/DC mode | Other configurations | Test applicability | Volunteer Company to lead CR |
| FG31-1:  L3 report based enhancement | 1 | FR2 unknown SCell activation with L3 report | 1. FR1 PCell+FR2 target SCell 2. FR2 PCell+FR2 inter-band target SCell 3. LTE PCell + FR1 PSCell + FR2 target SCell |  | Define test applicability and UE is required to perform one test for each FR.  UE only needs to pass test in one CA/DC mode. | QC |
| 2 | FR2 PUCCH SCell activation delay with L3 report |  | Huawei |
| 5 | FR1 unknown SCell activation with L3 report | 1. FR1 PCell+FR1 inter-band target SCell 2. LTE PCell + FR1 PSCell + FR1 inter-band target SCell |  | Define test applicability and UE is required to perform one test for each FR.  UE only needs to pass test in one CA/DC mode. | vivo |
| 7 | Multiple SCell activation delay with FR1 unknown SCell with L3 report |  | ZTE |
| FG31-2:  Beam sweeping factors reduction | 9 | FR2 unknown SCell activation with FG31-2 and FG31-3 | 1. FR1 PCell+FR2 target SCell 2. FR2 PCell+FR2 inter-band target SCell 3. LTE PCell + FR1 PSCell + FR2 target SCell | DRX.8: DRX cycle = 320 ms and TAT = Infinity | Verify UE supporting FG 31-2 and/or FG 31-3 for FR2, depending the capabilities supported by the UE.  FFS:UE only needs to pass test in one CA/DC mode. | Nokia |
| FG31-3:  (1)Use SSB periodicity instead of SMTC periodicity”  (2)“Performing L1-RSRP measurement in non-DRX mode even DRX is configured” | 17 | FR1 unknown SCell activation with FG31-3 | 1. FR1 PCell+FR1 inter-band target SCell 2. LTE PCell + FR1 PSCell + FR1 inter-band target SCell | DRX.8: DRX cycle = 320 ms and TAT = Infinity | Verify UE supporting FG 31-3 for FR1.  UE only needs to pass test in one CA/DC mode. | MTK |

**Issue 2-1: whether to verify requirement with L1 report for FG31-1 TC**

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| --- |
| Agreement:   * Calculate the M values based on UE capability in the corresponding sections.   Agreement:  DCI transmission timing: cover two case:   * Case 1: n+3ms+THARQ+M-k2   + FFS: UE pass condition is either UE to L1 or L3 report. * Case 2: n+[7]ms+ THARQ   + where k2=1 with type A mapping and startSymbolAndLength (SLIV) = 42 (L=4, and S=0).   DL scheduling for data starts from n+3ms.  Agreement in last meeting:   * + For all FG31-1 TCs, only verify the activation delay when L3 report is triggered.     - FFS UE reporting L1 is also a pass condition. |

* Option 1 (Apple):
  + For all FG31-1 TCs, only verify the activation delay when L3 report is triggered. But if UE can report L1-RSRP earlier than the target L3 reporting time (DCI triggered PUSCH), such UE can still be treated as “pass the test” as long as it can complete the SCell activation within the delay requirement of FR2 SCell activation enhancement with FG31-1.
* Option 2 (Nokia):
  + If DCI is scheduled within the time margin, UE is required to respond with the L3 report as long as there is a valid measurement result.
  + The test equipment sends TCI activation command after receiving the L3 report.
  + UE report of L1-RSRP shall not be considered as the pass condition of the FG31-1 TC.
* Option 3 (vivo):
  + If TE is able to deal with the TCI configuration/activation based on either L3 reporting or L1 reporting whichever is earlier, the test case shall allow UE reporting L1 as one pass condition.
  + According to core requirements, UE reporting L1 instead L3 shall complete the SCell activation within max(Tuncertainty\_MAC + TFineTiming + 2ms, Tuncertainty\_SP) after L1-RSRP is reported.
* Option 4 (CTC):
  + UE reporting L1 can also be a pass condition to verify the case that UE report both L3-RSRP reporting and L1-RSRP reporting before receiving TCI activation command.
* Option 5 (QC):
  + In sub-test1, UE consider pass if UE send L1 measurements and receive TCI activation command before UE send L3 reporting.
* Option 6 (HW):
  + For following case1, the TCI configuration is based on the L3 reporting regardless whether there is L1 reporting before n+3ms+THARQ+M, and UE shall be able to report L3 report as scheduled.
    - Case 1: n+3ms+THARQ+M-k2.
* Option 7 (Ericsson):
  + If UE is configured with periodic or semi-persistent CSI report, L1-RSRP report can be test passing condition, if UE do not receive UL grant before the L1-RSRP report is ready.
* Recommended WF
  + Moderator: discuss based on the following option A/B/C:
  + In case1 of test
    - Option A:
      * TE sends TCI activation CMD after L3 report
        + If DCI is scheduled within the time margin, UE is required to respond with the L3 report as long as there is a valid measurement result regardless whether there is L1 reporting before n+3ms+THARQ+M. (Apple, Nokia, HW)
        + UE can still be treated as “pass the test” as long as it can complete the SCell activation within the delay requirement of FR2 SCell activation enhancement with L3 report.
    - Option B:
      * TE sends TCI activation CMD after L1 report and before L3 report
        + Test case shall allow UE reporting L1 as one pass condition. (QC, vivo)
        + According to core requirements, UE reporting L1 instead L3 shall complete the SCell activation within max(Tuncertainty\_MAC + TFineTiming + 2ms, Tuncertainty\_SP) after L1-RSRP is reported. (vivo)
    - Option C:
      * If UE is configured with periodic or semi-persistent CSI report, L1-RSRP report can be test passing condition, if UE do not receive UL grant before the L1-RSRP report is ready. (Ericsson)

**Issue 2-2: DCI transmission timing for case 2 in FG31-1 TC**

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| --- |
| Agreement:  DCI transmission timing: cover two case:   * Case 1: n+3ms+THARQ+M-k2   + FFS: UE pass condition is either UE to L1 or L3 report. * Case 2: n+[7]ms+ THARQ   + where k2=1 with type A mapping and startSymbolAndLength (SLIV) = 42 (L=4, and S=0).   DL scheduling for data starts from n+3ms. |

* Option 1 (vivo, QC):
  + DCI transmission for case 2 is n+7ms+ THARQ.
* Recommended WF
  + Moderator: Agree on option 1.

**Issue 2-3: FG31-1 TC for CSSF2**

* Option 1 (HW):
  + Clarify the applicability rule that for UE supporting two PUCCH group, UE is required to pass TC#2.
* Recommended WF
  + Moderator: Agree on option 1.

**Issue 2-4: others for FG31-1 TC**

* Proposal 1 (QC):
  + The timeline is similar as legacy SCell activation TC three consecutive time (T1, T2, T3). No more optimization is needed to define additional time points.
* Proposal 2 (Ericsson):
  + RAN4 to include SR transmission in the test case for L3 report based fast SCell activation test case
* Recommended WF
  + FFS on P1 and P2.

**The CR submitted in this meeting:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CR tdoc** | **Company** | **Main revision** | **Status** | **Moderator suggestions** |
| [**R4-2407739**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407739.zip) | Nokia, Nokia Shanghai Bell | CR for section A7.5.3.16 based on 7738, and change A7.5.3.16 🡪 A.5.5.3.x | To be revised | Moderator put all CRs to be revised. If after discussion the revision is not needed and original version can be agreed, the revision tdoc can be withdrawn. |
| [**R4-2407768**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407768.zip) | vivo | CR on A.6.5.3.X, A.4.5.3.X (are these two TCs captured in the big CR R4-2407302 already?) | To be revised |
| [**R4-2408263**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408263.zip) | ZTE Corporation, Sanechips | CR on A.6.5.3.X, A.4.5.3.X to reflect K2 | To be revised |
| [**R4-2408566**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408566.zip) | Huawei, HiSilicon | CR on A.5.5.3.X1, A.7.5.3.X1 and A.7.5.3.X2. based on 8565 | To be revised |
| [**R4-2409709**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409709.zip) | Ericsson | CR on A.6.5.3.x, A.4.5.3.x, A.5.5.3.X1, A.7.5.3.X1, A.7.5.3.X2, A.6.5.3.x, A.4.5.3.x, A.7.5.3.16 based on 9708 | To be revised |