**3GPP TSG RAN WG1#105e R1-21nnnnn**

**e-Meeting, May 10th – 27th, 2021**

**Agenda Item: 7.2.2**

**Source: Moderator (Lenovo)**

**Title: Draft Feature lead summary on measurement during SCell activation**

**Document for: Discussion, Decision**

This document summarises the discussion on the following topics:

[105-e-NR-NRU-01] Email discussion/approval on measurement during SCell activation (DL-B2) until May 21 – Alex (Lenovo)

Corresponding discussion has taken place already in RAN1#104 and RAN1#104-e, with limited progress. Remaining open issues are relate to questions (2)(3)(4) by RAN4.

# Discussion for cases identified by RAN4

FL NOTE: A summary of the discussion in RAN1#104-e is available in R1-2103932. This discussion should target finding a consensus view on the open issues/questions, possibly touching upon behaviour as specified since Rel-15; this discussion may facilitate efficient future discussion in the scope of Rel-15, if necessary. Companies are invited to consider if other working groups can contribute to the resolution of the issues at hand.

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| In RAN1#104-e and RAN1#104bis-e, the LS from RAN4 was discussed. There was consensus on Question 1 and a reply LS [6] was sent to RAN4 clarifying the understanding from RAN1.For the other 3 questions: **Question by RAN4** (1) When none of the RRC parameters *CO-DurationPerCell-r16*, *SlotFormatIndicator*, and *CSI-RS-ValidationWith-DCI-r16* is configured for a UE on the being-activated SCell,1. What is the expected UE behaviour for this P/SP CSI-RS measurement and report on the being-activated SCell?

**Reply by RAN1:** As in Rel-15, the UE is expected to receive the P/SP CSI-RS.**Question 2:** When RRC parameters *CSI-RS-ValidationWith-DCI-r16* is configured, but *SlotFormatIndicator* and *CO-DurationPerCell-r16* are not configured for the being-activated SCell, what is the expected UE behavior for this P/SP CSI-RS measurement and report on the being-activated SCell? Does UE need to decode a DCI format from other active serving cell (indicating an aperiodic CSI-RS reception or scheduling a PDSCH reception in the set of symbols of the slot) for this being-activated SCell to validate this P/SP CSI-RS?**Question 3:** When RRC parameters *CO-DurationPerCell-r16* is configured but *SlotFormatIndicator* is not configured for the being-activated SCell, what is the expected UE behavior for this P/SP CSI-RS measurement and report on the being-activated SCell? Does UE need to decode a DCI format 2\_0 (indicating remaining channel occupancy duration) from other active serving cell for this being-activated SCell to validate the CSI-RS?**Question 4:** When RRC parameters *CO-DurationPerCell-r16* is not configured but *SlotFormatIndicator* is configured for the being-activated SCell, what is the expected UE behavior for this P/SP CSI-RS measurement and report on the being-activated SCell? Does UE need to detect a DCI format 2\_0 (indicating the starting point of CO duration and the slot format) from other active serving cell for this being-activated SCell to validate the CSI-RS? |

# Discussion

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| R1-2104272 (Huawei):***Observation 1: The behavior whether UE is able to acquire CSI request in DCI format 0-1, SFI or COT duration in DCI format 2-0 transmitted on the activated cell for the being activated cell should be clarified either in RAN1 or RAN2 before further discussing P/SP CSI-RS validation.***R1-2104831 (ZTE):**Observation 1: For being-activated SCell, UE maintains the same PDCCH monitoring behavior as defined for the deactivated SCell in TS 38.321, i.e. “not monitor the PDCCH on/for the SCell”.****Proposal 1: Alt 1 is a more appropriate understanding on “2> not monitor the PDCCH for the SCell;” for deactivated and being-activated SCell.*** **Alt 1: UE can monitor the PDCCHs sent by other active cells. And for Alt 1, there may be two kinds of understanding as follows:**
* **Understanding #1: UE expects that all detected PDCCHs sent by other active cells do not contain information for being-activated SCell.**
* **Understanding #12: UE ignores information for being-activated SCell if the detected PDCCHs sent by other active cells contain information for being-activated SCell, such as ap-CSI-RS or SFI.**

**Proposal 2: RAN1 can send a LS to RAN2 for confirming whether RAN1 has a correct understanding and whether RAN2 has other understandings on “2> not monitor the PDCCH for the SCell;”.****Proposal 3: On whether section 11 in TS 38.213 is also applicable to a being-activated SCell, the following two options can be considered. Among them, Opt 2 is preferred as UE will not monitor any PDCCH for the SCell or use any information indicated in PDCCHs for the SCell during SCell activation.*** **Opt 1: Section 11 in TS 38.213 is applied for a active cell and a being activated SCell**
* **Opt 2: Section 11 in TS 38.213 is only applied for a active cell**

**Proposal 4: If RAN1 can reach a consensus on Alt 1 and Opt 2, the same answer can be adopted for answering Q1~Q4 from RAN4, that is, UE proceeds with the p/sp-CSI-RS measurement in the set of symbols of the slot during SCell activation as in Rel-15.**R1-2105416 (LG):**Proposal #1: For a UE on a being-activated SCell, before the SCell is activated,*** **The UE does not monitor any DCI on the SCell.**
* **The UE does not monitor a DCI on other activated cell (e.g., PCell) that can schedule PDSCH on the being-activated SCell.**
* **The UE is not required to use information of the being-activated SCell in DCI format 2\_0 that is transmitted on other activated cell.**
* **The UE is not required to use information of the being-activated SCell in UL grant that is transmitted on other activated cell and that can trigger aperiodic CSI-RS on the being-activated SCell.**

**Proposal #2: When RRC parameter *csi-RS-ValidationWithDCI-r16* is configured, but *CO-DurationsPerCell* and *SlotFormatCombinationsPerCell* are not configured for a UE on a being-activated SCell, before the SCell is activated, UE is not required to receive P/SP-CSI-RS for the being-activated SCell.****Proposal #3: When one of *CO-DurationsPerCell* and *SlotFormatCombinationsPerCell* is configured for a UE on a being-activated SCell, before the SCell is activated, UE is not required to receive P/SP-CSI-RS for the being-activated SCell.**From the preparation phase discussion (comment by Ericsson):This issue has been extensively discussed in the last 2 meetings. Consensus has not been achieved due to differing views on some fundamental aspects of UE behavior that touch on Rel-15 carrier aggregation implementations. It is very hard to make progress in NR-U until these are resolved. As we indicated in the last meeting, the fundamental UE behavior aspects need to be discussed in Rel-15 maintenance first. Once discussion has occured there, then further progress can be made in NR-U. Unless/until that discussion happens in Rel-15 maintenance, we will object to sending an LS reply back to RAN4 as we did in the last meeting. |

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| Company  | Comments |
| ZTE, Sanechips | We think “2> not monitor the PDCCH for the SCell;” for deactivated defined in 38.321 is clear, it can have the following understanding:- UE can monitor the PDCCHs sent by other active cells. - UE does not expect that any detected PDCCHs sent by other active cells contain information for deactivated/being-activated SCell. - If the detected PDCCHs sent by other active cells contain information for being-activated SCell (it can be seen as a network error), UE should ignore the information.Based on above understanding, we think section 11 in TS 38.213 is only applied for an active cell. The same answer can be adopted for answering Q1~Q4 from RAN4, that is, UE proceeds with the p/sp-CSI-RS measurement in the set of symbols of the slot during SCell activation as in Rel-15 NR.Since some companies have different understanding on “2> not monitor the PDCCH for the SCell;”, in order to solve the problem of RAN4 as soon as possible, we think RAN1 should send an LS to RAN2 for clarification. Besides, we also want to share an information that the issue on how to interpret and understand the description “2> not monitor the PDCCH for the SCell;” is being discussed in RAN2.Further, if most companies think that this issue should be discussed in Rel-15 maintenance, it is also fine for us, as long as we can reach a consensus on this issue to push it forward. |
| Ericsson | As we indicated in the previous meeting, we invite companies to contribute to RAN1 Rel-15 maintenance if they see a problem in specifications on this fundamental issue. As we indicated last meeting, and in the preparation phase for this meeting, or position on this is rather firm: we object to sending an LS to either RAN2 or RAN4 unless/until discussion has occurred in the appropriate place (RAN1 Rel-15 maintenance) to resolve any potential interpretation issues w.r.t. Rel-15 specifications. Without consensus on the core issue, answering Question 2/3/4 in the RAN4 LS is difficult.Our objection to sending an LS to RAN2 is based on the fact that after technical discussion in RAN1 NR-U in the previous two meetings, it became clear that the UE can be configured to monitor PDCCH on and for the PCell which may include cross carrier information for the SCell being activated, e.g., ap-CSI-RS trigger provided in DCI 0\_1 or SFI provided in DCI 2\_0. The point of disagreement is whether or not the UE is expected to use that information on the SCell. Our view is that that specifications are clear on this, and the answer is "yes" the UE is expected to receive that information. Once received, the UE can use information can be used to validate p/sp-CSI-RS on the SCell. We understand that there are differing interpretations on the reception of this info, and since this touches on Rel-15 behavior (and implementations), our firm view is that this needs to be discussed in Rel-15 maintenance. We have a firm position that there is no value in sending an LS to RAN2 on the interpretation of "“2> not monitor the PDCCH for the SCell;” since that is not the core issue. Clearly, this clause states that the UE is not expected to monitor PDCCH for the SCell in terms of PDSCH/PUSCH scheduling, but does not apply to monitoring PDCCH on/for the PCell with cross-carrier information as described above.  |