**VERYU 3GPP TSG-RAN2 Meeting #110 Electronic  *Draft\_R2-*** ***2005796***

**1st June – 12th June 2020**

**Agenda item: 6.16.3**

**Source: Samsung**

**Title: Summary of proposed corrections (AI 6.16.3) (Phase 2)**

**Document for: Discussion and Decision**

# Introduction

This contribution is to further discuss the aspect highlighted in yellow

Proposal 1: For a pending SR triggered prior to the MAC PDU assembly for beam failure recovery of an SCell sr-ProhibitTimer shall be stopped when the MAC PDU is transmitted and this PDU includes an BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of that Scell.

* Nokia thinks this does not fully align to BSR (which was the intent), for the truncated BFR MAC CE case
* Samsung thinks the proposal is for the case the truncated BFR MAC CE includes full information
* ZTE agrees with Nokia
* Agree that some revision is needed along the lines of P1. Check the details regarding truncated BFR MAC CE case. Continue during the second round of offline [103]

Proposal 3: Design new SP/AP SRS spatial relation indication MAC CE for multiple serving cells case. Annexure 6 is the baseline.

* QC agrees with the proposal but would like to discuss the exact details (not agree immediately on Annex 6). QC wonders whether we need an A/D field.
* Agreed. Check the exact details (Annex 6 is a baseline for discussion but not endorsed yet). Continue during the second round of offline [103]

# Discussion

## SR Prohibit Timer

According to MAC spec, SR cancellation criteria for the case when MAC PDU including MAC CE for SCell BFR is transmitted is as follows: "Pending SR triggered prior to the MAC PDU assembly for beam failure recovery of an SCell shall be cancelled when the MAC PDU is transmitted and this PDU includes an BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of that SCell."

*Observation: SR cancellation criteria considers both BFR MAC CE and Truncated BFR MAC CE*

Based on previous discussion, *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted and this PDU includes an BFR MAC CE for SCell BFR. One of the following texts (both have same consequence) can be added in spec to capture this:.

* TP 1: For a pending SR triggered prior to the MAC PDU assembly for beam failure recovery of an SCell, *sr-ProhibitTimer* corresponding to the SR configuration for SCell BFR shall be stopped when the MAC PDU is transmitted and this PDU includes an BFR MAC CE which contains beam failure recovery information of that SCell.
* TP 2: *sr-ProhibitTimer* corresponding to the SR configuration for SCell BFR shall be stopped when the MAC PDU is transmitted and this PDU includes a BFR MAC CE for SCell BFR.

The case which needs further discussion is whether to stop *sr-ProhibitTimer* when the MAC PDU is transmitted and this PDU includes Truncated BFR MAC CE which contains beam failure recovery information of SCell(s). According to observation 1 above, SR is cancelled in this case. If *sr-ProhibitTimer* is not stopped, it will delay the SRs triggered after initiation of MAC PDU assembly.

**Q 1. Do you agree to stop sr-ProhibitTimer when the MAC PDU is transmitted and this PDU includes Truncated BFR MAC CE which contains beam failure recovery information of SCell(s)?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
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If above is agreed, one of the following texts (both have same consequence) can be added in spec to capture this:.

* TP 3: For a pending SR triggered prior to the MAC PDU assembly for beam failure recovery of an SCell, *sr-ProhibitTimer* corresponding to the SR configuration for SCell BFR shall be stopped when the MAC PDU is transmitted and this PDU includes an BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of that SCell. (See annexure 1)
* TP 4: *sr-ProhibitTimer* corresponding to the SR configuration for SCell BFR shall be stopped when the MAC PDU is transmitted and this PDU includes a BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of SCell(s). (See annexure 2)

**Q2 If answer to Q1 is yes, indicate your preference for text proposal (annexure 1, annexure 2)**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
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## SP/AP SRS spatial relation indication MAC CE for Multiple Serving Cells

RAN1 replied to RAN2 questions in R1-2002798/ R2-2004251 on SRS activation/deactivation MAC CE for the list of serving cells:

**Question 4.** RAN2 would like to ask RAN1 whether the intention is to activate per SRS resource set or per SRS resource. Further, if per SRS resource, whether RAN1 sees any issues in indicating spatial relation, potentially different, for more than one resource in one MAC CE in order to save overhead.

**Answer 4.**

RAN1 understands that the intention of the agreement is to support activating the independent spatial relations for SRS resource(s) in an SRS resource set.  Furthermore, RAN1 see no issue in using one MAC CE (to save overhead) to activate/deactivate spatial relations for >1 SRS resources from an SRS resource set.

According to the above response from RAN1, it can be observed that the requirement from RAN1 is to support activating the spatial relation information for the indicated SRS resource. One remark is that it has been agreed to consider supporting update spatial relation for both the AP and SP SRS source inside one MAC CE as well as extending the spatial relation resource ID field for larger ID space of NZP CSI-RS resource in the RAN2 #109bis-e meeting i.e. Enhanced SP/AP SRS spatial relation indication MAC CE.

During the RAN2#110-e online session, it was agreed that the new SP/AP SRS spatial relation indication MAC CE for multiple serving cells case will be introduced and the detail design of the MAC CE is further discussed in Phase II discussion. In addition, Annexure 3 will be the baseline of the discussion as agreed on the online session.

Agreements via email (from [103][EMIMO]):

1. Clarify that a MAC PDU shall contain at most one BFR MAC CE.
2. Design new SP/AP SRS spatial relation indication MAC CE for multiple serving cells case. Annexure 6 is the baseline for discussion but not endorsed yet.
3. Clarify that the pathloss reference RS is updated by this MAC CE in the SRI-PUSCH-powercontrol mappings provided in the same MAC CE.
4. RAN2 confirm that the multiple PUCCH resources can be indicated in an Enhanced PUCCH spatial relation Activation/Deactivation MAC CE.

For the new design of this MAC CE, one company proposed to introduce A/D field (i.e. replace SUL field to A/D field) because this MAC CE support activation/deactivation, but another opinion is that this MAC CE includes multiple serving cells so replacing SUL field to A/D field cannot fully solve the intended operation.

**Q3 Do you agree that this MAC CE needs the A/D field(s)?**

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| **Company** | **Preference (Y/N)** | **Detailed Comments** |
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**Q4 Please provide the detail suggestion for the new MAC CE compared to the Annexure 3.**

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| **Company** | **Detailed Comments** |
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# Summary

# Annexure 1

### 5.4.4 Scheduling Request

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Except for SCell beam failure recovery, all pending SR(s) for BSR triggered according to the BSR procedure (clause 5.4.5) prior to the MAC PDU assembly shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted, regardless of LBT failure indication from lower layers, and this PDU includes a Long or Short BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see clause 5.4.5) prior to the MAC PDU assembly. Except for SCell beam failure recovery, all pending SR(s) for BSR triggered according to the BSR procedure (clause 5.4.5) shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the UL grant(s) can accommodate all pending data available for transmission. Pending SR triggered prior to the MAC PDU assembly for beam failure recovery of an SCell shall be cancelled and respective *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted and this PDU includes an BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of that SCell. Pending SR triggered for beam failure recovery of a SCell shall be cancelled upon deactivation of that SCell (as defined in clause 5.9).

The MAC entity shall for each pending SR triggered by consistent LBT failure:

1> if a MAC PDU is transmitted, regardless of LBT failure indication from lower layers, and the MAC PDU includes an LBT failure MAC CE that indicates consistent LBT failure for the Serving Cell that triggered this SR; or

1> if the corresponding consistent LBT failure is cancelled (see clause 5.21):

2>cancel the pending SR and stop the corresponding *sr-ProhibitTimer*.

# Annexure 2

### 5.4.4 Scheduling Request

:

Except for SCell beam failure recovery, all pending SR(s) for BSR triggered according to the BSR procedure (clause 5.4.5) prior to the MAC PDU assembly shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted, regardless of LBT failure indication from lower layers, and this PDU includes a Long or Short BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see clause 5.4.5) prior to the MAC PDU assembly. Except for SCell beam failure recovery, all pending SR(s) for BSR triggered according to the BSR procedure (clause 5.4.5) shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the UL grant(s) can accommodate all pending data available for transmission. Pending SR triggered prior to the MAC PDU assembly for beam failure recovery of an SCell shall be cancelled when the MAC PDU is transmitted and this PDU includes an BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of that SCell. Pending SR triggered for beam failure recovery of a SCell shall be cancelled upon deactivation of that SCell (as defined in clause 5.9). *sr-ProhibitTimer* corresponding to the SR configuration for SCell BFR shall be stopped when the MAC PDU is transmitted and this PDU includes a BFR MAC CE or Truncated BFR MAC CE which contains beam failure recovery information of SCell(s).

The MAC entity shall for each pending SR triggered by consistent LBT failure:

1> if a MAC PDU is transmitted, regardless of LBT failure indication from lower layers, and the MAC PDU includes an LBT failure MAC CE that indicates consistent LBT failure for the Serving Cell that triggered this SR; or

1> if the corresponding consistent LBT failure is cancelled (see clause 5.21):

2> cancel the pending SR and stop the corresponding *sr-ProhibitTimer*.

# Annexure 3

#### 6.1.3.29 Serving Cell set based SRS Activation/Deactivation MAC CE

The Serving Cell set based SRS Activation/Deactivation MAC CE is identified by a MAC subheader with eLCID as specified in Table 6.2.1-1b. It has a variable size and consists of the following fields:

- SUL: This field indicates whether the MAC CE applies to the NUL carrier or SUL carrier configuration. This field is set to 1 to indicate that it applies to the SUL carrier configuration, and it is set to 0 to indicate that it applies to the NUL carrier configuration;

- SRS Resource’s Cell ID: This field indicates the identity of the Serving Cell, which contains the indicated SP/AP SRS Resource Set. If the C field is set to 0, this field also indicates the identity of the Serving Cell which contains all resources indicated by the Resource IDi fields. The length of the field is 5 bits. If the indicated Serving Cell is configured as part of a *simultaneousSpatial-UpdatedList1-r16* or *simultaneousSpatial-UpdatedList2-r16* as specified in TS 38.331 [5], this MAC CE applies to all the Serving Cells configured in the set *simultaneousSpatial-UpdatedList1-r16* or *simultaneousSpatial-UpdatedList2-r16, respectively;*

 - SRS Resource's BWP ID: This field indicates a UL BWP as the codepoint of the DCI *bandwidth part indicator* field as specified in TS 38.212 [9], which contains the indicated AP/SP SRS Resource. If the C field is set to 0, this field also indicates the identity of the BWP which contains all resources indicated by the Resource IDi fields. The length of the field is 2 bits;

- C: This field indicates whether the octets containing Resource Serving Cell ID field(s) and Resource BWP ID field(s) are present. If this field is set to 1, the octets containing Resource Serving Cell ID field(s) and Resource BWP ID field(s) are present, otherwise they are not present;

- SP/AP SRS Resource IDi: This field indicates the SP/AP SRS Resource ID identified by *SRS-ResourceId* as specified in TS 38.331 [5]. The length of the field is 6 bits;

- Fi: This field indicates the type of a resource used as a spatial relationship for SRS resource within SP/AP SRS Resource Set indicated with SP/AP SRS Resource IDi field. F0 refers to the first SRS resource which is indicated SP/AP SRS Resource ID1, F1 to the second one and so on. The field is set to 1 to indicate NZP CSI-RS resource index is used, and it is set to 0 to indicate either SSB index or SRS resource index is used. The length of the field is 1 bit;

- Resource IDi: This field contains an identifier of the resource used for spatial relationship derivation for SRS resource i. Resource ID0 refers to the first SRS resource which is indicated SP/AP SRS Resource ID1, Resource ID1 to the second one and so on. If Fi is set to 0, the first bit of this field is always set to 0. If Fi is set to 0, and the second bit of this field is set to 1, the remainder of this field contains *SSB-Index* as specified in TS 38.331 [5]. If Fi is set to 0, and the second bit of this field is set to 0, the remainder of this field contains *SRS-ResourceId* as specified in TS 38.331 [5]. The length of the field is 8 bits.

- Resource Serving Cell IDi: This field indicates the identity of the Serving Cell on which the resource used for spatial relationship derivation for SP/AP SRS Resource IDi is located. The length of the field is 5 bits;

- Resource BWP IDi: This field indicates a UL BWP as the codepoint of the DCI *bandwidth part indicator* field as specified in TS 38.212 [9], on which the resource used for spatial relationship derivation for SP/AP SRS Resource IDi is located. The length of the field is 2 bits;

- R: Reserved bit, set to 0.



**Figure 6.1.3.29-1: Serving Cell set based SRS Activation/Deactivation MAC CE**