**3GPP TSG-RAN WG2 Meeting #121 *R2-230***

**Athens, Greece, 27th Feb– 3rd Mar., 2023**

**Title: [AT121][405][POS] Editorial MAC issues and interaction with PHY (Huawei)**

**Source: Huawei, HiSilicon**

**Agenda item: 6.7.4**

**Document for: Discussion and Decision**

# Introduction

During the online discussion in R2#112, the following conclusion has been made on the email discussion for several issues related to MAC spec

**[AT121][405][POS] Editorial MAC issues and interaction with PHY (Huawei)**

Scope: Check the editorial issues in R2-2300936 and the change in R2-2301832.

Intended outcome: Agreeable CR

Deadline: Wednesday 2023-03-01 1900 EET

# Editorials corrections for MAC spec

[R2-2300936](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202302-03%20-%20RAN2_121,%20Athens\Extracts\R2-2300936%20Correction%20to%20MAC%20spec%20for%20positioning.doc) Correction to MAC spec for positioning ZTE Corporation CR Rel-17 38.321 17.3.0 1536 - F NR\_pos\_enh-Core

Within the above CR, the following editorial issues have been mentioned:

* **Change 1**: In clause 5.25，it is positioning measurement gap, not measurement gap. The following change is proposeed

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| 5.25 Positioning Measurement Gap Activation/Deactivation Request  If the UE is configured with pre-configured positioning measurement gap, the UE may request the network to activate or deactivate the Positioning measurement gap with UL MAC CE for Positioning Measurement Gap Activation/Deactivation Request in clause 6.1.3.40. |

The rapp would like to ask the following question:

***Question1*: Do companies think that the above change is needed?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **ZTE** | **Yes** |  |
| **OPPO** | **OK** |  |
| **CATT** | **OK** |  |
| **Samsung** | **Yes** |  |

* **Change 2**: In clause 5.26.2, the words ‘for *inactivePosSRS-TimeAlignmentTimer*’ is redundant, since the UE can’t know which timer (i.e.*,cg-SDT-TimeAlignmentTimer* or *inactivePosSRS-TimeAlignmentTimer*) the Timing Advance Command MAC CE is for when the TAC MAC CE is received. As soon as Timing Advance Command MAC CE is received, the expected action in clause 5.26.2 shall be performed.In addition, the MAC entity shall update the stored RSRP, rather than updating the stored downlink pathloss reference. Some grammatical mistakes are modified by the way. The following change has been made

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| 5.26.2 TA validation for SRS transmission in RRC\_INACTIVE  RRC configures the following parameters for validation for SRS transmission in RRC\_INACTIVE:  - *inactivePosSRS-RSRP-ChangeThreshold*: RSRP threshold for the increase/decrease of RSRP for time alignment validation.  The MAC entity shall:  1> if the UE receives configuration for SRS transmission in RRC\_INACTIVE:  2> store the RSRP of the downlink pathloss reference with the current RSRP value of the downlink pathloss reference as in TS 38.331 [5].  1> else if the UE is configured with SRS transmission in RRC\_INACTIVE:  2> if Timing Advance Command MAC CE is received, or;  2> if Timing Advance Command or Absolute Timing Advance Command is received for Random Access procedure that is successfully completed:  3> update the stored RSRP of the downlink pathloss reference with the current RSRP value of the downlink pathloss reference. |

The rapp would like to ask the following question:

***Question2*: Do companies think that the above change is needed?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| **ZTE** | **Yes** |  |
| **OPPO** | **Yes** |  |
| **CATT** | **Yes** |  |
| **Samsung** | **Yes with comment.** | **We prefer to keep ‘as in clause 5.2’ to refer to the TA update procedure in clause 5.2 as below.**  **2> if Timing Advance Command MAC CE is received ~~for inactivePosSRS-TimeAlignmentTimer~~ as in clause 5.2,** |

* **Change 3**: In clause 6.1.3.42, it is *dl-PPW-ID*, not *PPW-ID*. The following change has been proposed

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| 6.1.3.42 PPW Activation/Deactivation Command MAC CE  The PPW Activation/Deactivation Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b.  It has variable size defined as follows (Figure 6.1.3.42-1):  - numEntry: This field indicates the number of entries N-1 in the MAC CE. 00 indicates that N equals to 2; 01 indicates that N equals to 3 and so on. The length of the field is 2 bits;  - Serving Cell ID: This field indicates the identity of the Serving Cell for which the MAC CE applies. The length of the field is 5 bits;  - PPW ID: This field indicates the index of the PPW configured on active DL BWP of the Serving Cell identified by the above Serving Cell ID. Index 0 corresponds to the first entry within the list of the PPW configuration by the increasing order of *dl-PPW-ID* in TS 38.331 [5] in this BWP, index 1 corresponds to the second entry in the list and so on. The length of the field is 2 bits; |

The rapp would like to ask the following question:

***Question3*: Do companies think that the above change is needed?**

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| **Company** | **Yes/No** | **Comments** |
| **ZTE** | **Yes** |  |
| **OPPO** | **Yes** |  |
| **CATT** | **Yes** |  |
| **Samsung** | **Yes** |  |

# Positioning SRS transmission in RRC\_INACTIVE

The main issue related to the discussion in this section is on the following CR

[R2-2301832](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202302-03%20-%20RAN2_121,%20Athens\Extracts\R2-2301832%20Correction%20to%20validation%20for%20INACTIVE%20posSRS%20transmission_final.docx) Correction to validation for INACTIVE posSRS transmission Huawei, HiSilicon CR Rel-17 38.321 17.3.0 1508 1 F NR\_pos\_enh-Core R2-2300113

## 3.1 Reference to R1 spec for validation of SRS transmission

The issue with validation for positioning SRS transmission has been mentioned, it is pointed out that

* For the validation of spatial relationship for SRS transmission in RRC\_INACTIVE, the following has been captured in TS 38.214 Clause 6.2.1.4

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| If the UE in RRC\_INACTIVE mode determines that the UE is not able to accurately measure the configured DL RS in SRS-SpatialRelationInfoPos for a SRS resource for positioning where the DL RS is semi-persistent or periodic, the UE stops transmission of the SRS resource for positioning |

* For the open-loop power control for posSRS transmission in RRC\_INACTIVE, the following has been captured in TS 38.213 Clause 7.3.1

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| --- |
| If the UE is in the RRC\_CONNECTED state and determines that the UE is not able to accurately measure PL\_(b,f,c) (q\_d ), or the UE is not provided with pathlossReferenceRS-Pos, the UE calculates PL\_(b,f,c) (q\_d ) using a RS resource obtained from the SS/PBCH block of the serving cell that the UE uses to obtain MIB. If the UE is in the RRC\_INACTIVE state and determines that the UE is not able to accurately measure PL\_(b,f,c) (q\_d ), the UE does not transmit SRS for the SRS resource set. |

While in the current MAC spec, the condition for SRS transmission only includes the TA validation. Thus the following change has been made.

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| 5.26 Positioning SRS transmission in RRC\_INACTIVE  5.26.1 General  Periodic and semi-persistent Positioning SRS can be configured for Positioning SRS transmission in RRC\_INACTIVE.  The MAC entity shall, if the TA of the configured Positioning SRS is valid according to clause 5.26.2, the pathloss reference of the configured Positioning SRS is valid according to clause 7.3.1 of TS 38.213 [6] and spatial relation of the configured Positioning SRS is valid according to clause 6.2.1.4 of TS 38.314 [7]:  - transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.214 [7]. |

We would like to ask the following question regarding the above change:

***Question4*: Do companies think the above change is needed in the MAC spec that we add reference to R1 spec for the validation of spatial relation and pathloss for SRS transmission?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| ZTE | No | Not necessary to present PHY detail in the MAC layer. Suggest the following change:  The MAC entity shall, if the TA of the configured Positioning SRS is valid according to clause 5.26.2:  - transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.213 [6] and TS 38.214 [7]. |
| OPPO |  | We prefer following change to let the PHY layer to decide whether or not to transmit the SRS:  The MAC entity shall, if the TA of the configured Positioning SRS is valid according to clause 5.26.2,  - indicate the physical layer to transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.213 [6] and TS 38.214 [7]. |
| CATT | No | The judgment of TA validity in MAC entity makes sense but no need to put the judgment in PHY layer into MAC protocol.  The MAC entity just focuses on the TA validity and sends an indication to PHY layer. |
| Samsung | No | Support the correction suggested by OPPO above with minor correction for the consistency of the wording in 38.321.  - instruct the physical layer to transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.213 [6] and TS 38.214 [7].  Please, refer to the existing wording as below examples.  ‘1> instruct the physical layer to transmit the MSGA using the selected PRACH occasion’  ‘2> instruct the physical layer to transmit SCI according’  … |

## 3.2 Interaction between PHY and MAC

During online discussion, company raised the concern on how the MAC should interact with PHY for the transmission of SRS. With a small offline, the rapp understood the intention of the proponent of the issue. The following change is desirable from the proponent’s point of view.

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| 5.26.1 General  Periodic and semi-persistent Positioning SRS can be configured for Positioning SRS transmission in RRC\_INACTIVE.  The MAC entity shall, if the TA of the configured Positioning SRS is valid according to clause 5.26.2:  - indicate to the lower layer to transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.214 [7]. |

We would like to ask the following question regarding the above change:

***Question5*: Do companies think the above change is needed in the MAC spec?**

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| **Company** | **Yes/No** | **Comments** |
| ZTE | Yes | Similar as Q4, we suggest the following change:  Periodic and semi-persistent Positioning SRS can be configured for Positioning SRS transmission in RRC\_INACTIVE.  The MAC entity shall, if the TA of the configured Positioning SRS is valid according to clause 5.26.2:  - indicate to the lower layer to transmit Positioning Periodic SRS or Semi-Persistent SRS defined in TS 38.213 [6] and TS 38.214 [7]. |
| OPPO | Yes | Such interaction method could also deal with the physical layer criteria regarding the transmission of the SRS |
| CATT | Yes | The modification here is good enough which describes the work in MAC clearly. |
| Samsung | Yes | Please, find our response in Q4. |

# Summary

Based on the discussion above, we propose the following for this email discussion