**3GPP TSG-RAN Meeting #111 R2-200xxxx**

**Electronic meeting, 17th – 28th August 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **38.305** | **CR** | **0033** | **rev** | **-** | **Current version:** | **16.1.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:***  | Signalling sequence correction for UL SRS Configuration |
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| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_Pos-Core |  | ***Date:*** | 2020-08-25 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | Currently, the 38.305 captures the UL SRS configuration with a step number 5 which says “The LMF may request activation of UE SRS transmission”. However, this step 5 is not possible for periodic SRS transmission. There is no separate activate SRS command from gNB. Only for Semi-Persistent and Aperiodic SRS configuration; via MAC CE and DCI respectively; the step 5 is possible. This clarification is needed. **Impact analysis**Impacted 5G architecture options:NR SA, NR-DC, NE-DC Impacted functionality:UL SRS Configuration Inter-operability:If the network is implemented according to the CR and the UE is not, there may be problem while configuring periodic SRS configuration.If the UE is implemented according to the CR and the network is not, there may be problem while configuring periodic SRS configuration.  |
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| ***Summary of change:*** | Clarification is added that step 5 is only applicable for semi-persistent and aperiodic UL SRS configuration |
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| ***Consequences if not approved:*** | Incorrect description for UL SRS configuration as one of the step is not applicable for periodic SRS configuration |
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| ***Clauses affected:*** | 8.10.4, 8.13.3.4, 8.14.3.4 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*Beginning of Change*

### 8.10.4 Sequence of Procedure for Multi-RTT positioning

Figure 8.10.4-1 shows the messaging between the LMF, the gNBs and the UE to perform LMF-initiated Location Information Transfer Procedure for Multi-RTT.



Figure 8.10.4-1: Multi-RTT positioning procedure

0. The LMF may use the procedure in Figure 8.10.3.2.1-1 to obtain the TRP information required for Multi-RTT positioning.

1. The LMF may request the positioning capabilities of the target device using the LPP Capability Transfer procedure described in clause 8.10.3.1.1.

2. The LMF sends a NRPPa POSITIONING INFORMATION REQUEST message to the serving gNB to request UL information for the target device as described in Figure 8.10.3.2.1-2.

3. The serving gNB determines the resources available for UL-SRS and configures the target device with the UL-SRS resource sets at step 3a.

4. The serving gNB provides the UL-SRS configuration information to the LMF in a NRPPa POSITIONING INFORMATION RESPONSE message.

NOTE: It is up to implementation on whether SRS configuration is provided earlier than DL-PRS configuration.

5. In the case of semi-persistent or aperiodic SRS, the LMF may request activation of UE SRS transmission and sends a NRPPa SRS Activation Request message to the serving gNB of the target device as described in subclause 8.10.3.2.3. The gNB then activates the UE SRS transmission. The target device begins the UL-SRS transmission according to the time domain behavior of UL-SRS resource configuration.

6. The LMF provides the UL information to the selected gNBs in a NRPPa MEASUREMENT REQUEST message as described in clause 8.10.3.2.2. The message includes all information required to enable the gNBs/TRPs to perform the UL measurements.

7. The LMF sends a LPP Provide Assistance Data message to the target device as described in subclause 8.10.3.1.2.1. The message includes any required assistance data for the target device to perform the necessary DL-PRS measurements.

8. The LMF sends a LPP Request Location Information message to request Multi-RTT measurements.

9a: The target device performs the DL-PRS measurements from all gNBs provided in the assistance data at step 7.

9b: Each gNB configured at step 6 measures the UE SRS transmissions from the target device.

10. The target device reports the DL-PRS measurements for Multi-RTT to the LMF in a LPP Provide Location Information message.

11. Each gNB reports the UE SRS measurements to the LMF in a NRPPa Measurement Response message as described in clause 8.10.3.2.2.

12. The LMF determines the RTTs from the UE and gNB Rx-Tx time difference measurements for each gNB for which corresponding UL and DL measurements were provided at steps 10 and 11 and calculates the position of the target device.

*Next Change*

8.13.3.4 Sequence of Procedure for UL-TDOA positioning

Figure 8.13.3.4-1 shows the messaging between the LMF, the gNBs and the UE to perform UL-TDOA procedure.

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**Figure 8.13.3.4-1: UL-TDOA positioning procedure**

0. The LMF may use the procedure in Figure 8.13.3.2.1-2 to obtain the TRP information required for UL-TDOA positioning.

1. The LMF may request the positioning capabilities of the target device using the LPP Capability Transfer procedure as described in clause 8.13.3.1.

2. The LMF sends a NRPPa POSITIONING INFORMATION REQUEST message to the serving gNB to request UL-SRS configuration information for the target device as described in Figure 8.13.3.2.1-1.

3. The serving gNB determines the resources available for UL-SRS and configures the target device with the UL-SRS resource sets at step 3a.

4. The serving gNB provides the UL information to the LMF in a NRPPa POSITIONING INFORMATION RESPONSE message.

5. In the case of semi-persistent or aperiodic SRS, the LMF may request activation of UE SRS transmission and sends a NRPPa SRS Activation Request message to the serving gNB of the target device as described in subclause 8.13.3.3a. The gNB then activates the UL-SRS transmission. The target device begins the UL-SRS transmission according to the time domain behavior of UL-SRS resource configuration.

6. The LMF provides the UL-SRS configuration to the selected gNBs in a NRPPa MEASUREMENT REQUEST message as described in clause 8.13.3.3. The message includes all information required to enable the gNBs/TRPs to perform the UL measurements.

7. Each gNB configured at step 6 measures the UL-SRS transmissions from the target device.

8. Each gNB reports the UL-SRS measurements to the LMF in a NRPPa Measurement Response message as described in clause 8.13.3.3.

*Next Change*

8.14.3.4 Sequence of Procedure for UL-AoA positioning

Figure 8.14.3.4-1 shows the messaging between the LMF, the gNBs and the UE to perform UL-AoA procedure.

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**Figure 8.14.3.4-1: UL-AoA positioning procedure**

0. The LMF may use the procedure in Figure 8.14.3.2.1-2 to obtain the TRP information required for UL-AoA positioning.

1. The LMF may request the positioning capabilities of the target device using the LPP Capability Transfer procedure as described in clause 8.14.3.1.

2. The LMF sends a NRPPa POSITIONING INFORMATION REQUEST message to the serving gNB to request UL-SRS configuration information for the target device as described in Figure 8.14.3.2.1-1.

3. The serving gNB determines the resources available for UL-SRS and configures the target device with the UL-SRS resource sets at step 3a.

4. The serving gNB provides the UL-SRS configuration information to the LMF in a NRPPa POSITIONING INFORMATION RESPONSE message.

5. In the case of semi-persistent or aperiodic SRS, the LMF may request activation of UE SRS transmission and sends a NRPPa SRS Activation Request message to the serving gNB of the target device as described in subclause 8.14.3.3a. The gNB then activates the UL-SRS transmission. The target device begins the UL-SRS transmission according to the time domain behavior of UL-SRS resource configuration.

6. The LMF provides the UL-SRS configuration to the selected gNBs in a NRPPa MEASUREMENT REQUEST message as described in clause 8.14.3.3. The message includes all information required to enable the gNBs/TRPs to perform the UL measurements.

7. Each gNB configured at step 6 measures the UL-SRS transmissions from the target device.

8. Each gNB reports the UL-SRS measurements to the LMF in a NRPPa Measurement Response message as described in clause 8.14.3.3.

*End of Change*