**3GPP TSG- Meeting #**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** | **-** | **Current version:** |  |  |
|  |
| *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 |  | Radio Access Network | **x** | Core Network | **x** |

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| ***Title:***  | Support of NR Positioning Enhancements |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, CATT, Huawei, Ericsson, Xiaomi, ZTE, Samsung |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** |  |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | The CR introduces functionality for support of NR positioning enhancements. |
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| ***Summary of change:*** | Add description of procedures for area-specific SRS configuration |
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| ***Consequences if not approved:*** | Missing stage 2 for support of NR positioning enhancements.  |
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| ***Clauses affected:*** | 7.x (new) |
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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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | RAN3#121bis (post): Inclusion of agreed TP (R3-235812)RAN3#122 (pre): Resubmission to RAN3#122RAN3#122 (post): Inclusion of agreed TP (R3-237917)RAN3#123 (pre): Resubmission to RAN3#123RAN3#123 (post): Inclusion of agreed TP (R3-240902) |

*Start of change*

## 7.x Procedures for Area-specific SRS Configuration

### 7.x.1 General

To support Low Power and High Accuracy Positioning (LPHAP) as defined in TS 23.273 [35], area-specific SRS configuration is used to enable SRS transmission by the RRC\_INACTIVE UE, within positioning validity cell list(s).

### 7.x.2 Area-specific SRS (Pre-)configuration Allocation Procedure

Figure 7.x.2-1 shows the Area-specific SRS (Pre-)configuration Allocation procedure.



Figure 7.x.2-1: Area-specific SRS (Pre-)configuration Allocation Procedure

1. The LMF sends the NRPPa Positioning Information Request message to the serving gNB of the UE for Area-specific SRS (Pre-)configuration allocation. In case of Area-specific SRS configuration allocation, the LMF includes the Requested SRS Transmission Characteristics including an associated Positioning Validity Area Cell List. In case of Area-specific SRS pre-configuration allocation, the LMF includes a list of Requested SRS Transmission Characteristics, each with the associated Positioning Validity Area Cell List.

2. The serving gNB allocates the area-specific SRS resources, and moves the UE to RRC\_INACTIVE state by sending the RRC Release message, which includes the area-specific SRS (pre-)configuration(s).

3. The serving gNB responds with the NRPPa Positioning Information Response message to the LMF, including one or more SRS configuration(s), each with the associated Positioning Validity Area Cell List.

4. The LMF notifies the gNBs within the positioning validity area(s) to reserve the SRS resources.

NOTE: Step 4 may occur prior to any of steps 1 through 3.

### 7.x.3 Area-specific SRS Configuration Update Procedure

Figure 7.x.3-1 shows the Area-specific SRS Configuration Update procedure.



Figure 7.x.3-1: Area-specific SRS Configuration Update Procedure

0. The UE in RRC\_INACTIVE state is configured with an area-specific SRS configuration and reselects to a cell that is not included in the Validity Area Cell List.

1. The UE sends the RRC Resume Request message with the resume cause “srs-PosConfigOrActivationReq” to request for new SRS configuration.

2. The receiving gNB which receives the request from the UE triggers the Retrieve UE Context procedure towards the last serving gNB.

3. The last serving gNB sends the NRPPa Positioning Information Update message to notify the LMF the UE moved out of the validity area by providing the Cell ID of the receiving gNB where the UE resumes at.

4. The last serving gNB relocates the full UE context to the receiving gNB.

5. The receiving gNB triggers the Path Switch Request procedure towards the AMF.

6. The AMF responds with the NGAP Path Switch Request Acknowledge message.

7. The LMF requests the receiving gNB to allocate a new SRS configuration for the UE. If the Positioning Validity Area Cell List is included in the Requested SRS Transmission Characteristics, the Area-specific SRS Configuration Allocation procedure as specified in section 7.x.2 is applied. Otherwise, the legacy SRS allocation procedure is applied.

8. The receiving gNB indicates to the last serving gNB to release the UE context.

*End of change*