**3GPP TSG-RAN4 Meeting #97-e *R4-2017145***

**Electronic Meeting, 2 – 13 November, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | 1324 | **rev** | **1** | **Current version:** | **16.5.0** |  |
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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 |  | Core Network |  |

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| ***Title:***  | CR to update PRS-RSRP measurement requirements |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_pos-Core |  | ***Date:*** | 2020-09-21 |
|  |  |  |  |  |
| ***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:*** | 1. The measurement period is FFS for the case when measurement gaps and processing time T do not have overlap between different positioning frequency layers
2. The definition of Lprs used in defining measurement period is not fully clear
3. The reporting requirements for aperiodic reporting is FFS
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| ***Summary of change:*** | 1. Remove the editor note and apply the same measurement period for the non-overlapping case
2. Clarify the definition of Lprs
3. Remove the editor note related to reporting requirements for aperidoci reporting.
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| ***Consequences if not approved:*** |  Core requriements for PRS-RSRP are incomplete. |
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| ***Clauses affected:*** | 9.9.3 |
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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:*** |  |

<Start of Change 1>

### 9.9.3 PRS-RSRP measurements

#### 9.9.3.1 Introduction

The requirements in clause 9.9.3.5 shall apply provided the UE has received a message from LMF via LPP [34] requesting the UE to measure and report PRS-RSRP measurements defined in TS 38.215 [4].

#### 9.9.3.2 Requirements applicability

The requirements in clause 9.9.3 apply for periodic and triggered PRS-RSRP measurements, provided:

- PRS-RSRP related side conditions given in clause 10.1.24 are met for a corresponding Band.

#### 9.9.3.3 Measurement Capability

UE PRS-RSRP measurement capability is as indicated by the UE in *NR-DL-AoD-ProvideCapabilities* according to TS 37.355 [34].

#### 9.9.3.4 Measurement Reporting Requirements

This requirement assumes that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTIDCCH where TTIDCCH is the duration of subframe or slot or subslot when the measurement report is transmitted on the PUSCH with subframe or slot or subslot duration. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

The reported PRS-RSRP measurement values contained in measurement reports shall be based on the measurement report mapping requirements specified in clauses 10.1.24.3.

The PRS-RSRP measurement accuracy for all measured PRS resources shall be fulfilled according to the accuracy requriements specified in the clauses 10.1.24.

#### 9.9.3.5 Measurement Period Requirements

When the physical layer receives *NR-DL-AoD-ProvideAssistanceData* message and *NR-DL-AoD-RequestLocationInformation* message from LMF via LPP [34], the UE shall be able to measure multiple (up to the UE capability specified in Clause 9.9.3.3) PRS-RSRP measurements, defined in TS 38.215 [4], from configured PRS resources for configured TRPs on configured PRS frequency layers, within ms.

If measurement gaps and processing time T have overlap between different frequency positioning frequency layers,

*Editor’s note: FFS the PRS-RSRP measurement period when measurement gaps and processing time T do not have overlap between different positioning frequency layers.*

where is the index of PRS frequency layer,

 is the measurement period for PRS-RSRP measurements in frequency layer i as defined further in this clause,

L is total number of positioning frequency layers, and is the periodicity of PRS-RSRP measurement in frequency layer i as defined further in this clause.

where

 is the carrier specific scaling factor for NR PRS-based measurements specified in clause 9.1.5.2 as defined in clause 9.1.5.2.5, 9.1.5.2.6, and 9.1.5.2.7 for SA, NE-DC, and NR-DC operation mode, respectively ,

is the scaling factor for Rx beam sweeping, and =1 if PRS layer i is in FR1 and =8 if PRS layer i is in FR2,

 is the size of the downlink PRS resource in the time domain defined in TS 38.211 [6] and indicated by the higher-layer parameter *dl-PRS-NumSymbols* specified in TS 37.355 [34],

 is the maximum number of DL PRS resources of frequency layer i configured in a slot,

 is UE capability combination per band where N is a duration of DL PRS symbols in ms corresponding to *durationOfPRS-ProcessingSysmbols* in TS 37.355 [34] processed every T ms corresponding to *durationOfPRS-ProcessingSymbolsInEveryTms* in TS 37.355 [34] for a given maximum bandwidth supported by UE corresponding to *supportedBandwidthPRS* in TS 37.355 [34],

 is UE capability for number of DL PRS resources that it can process in a slot as indicated by *maxNumOfDL-PRS-ResProcessedPerSlot* in clause 6.4.3 of TS 37.355 [34],

 is the number of PRS-RSRP measurement samples and = 4,

 is the measurement duration for the last PRS-RSRP sample, including the sampling time and processing time,  *= +*  is periodicity of PRS-RSRP measurement in frequency layer i:

where

 corresponds to *durationOfPRS-ProcessingSymbolsInEveryTms* in TS 37.355 [34],

 , the least common multiple between and

 is the maximum PRS resource periodicity among all PRS resources in frequency layer i,

 is the measurement gap repetition period in frequency layer i.

When PRS-RSRP measurements are configured for DL-AoD, the time starts from the first MG instance aligned with DL PRS resources of positioning frequency layer *i* closest in time after both the *NR-DL-AoD-RequestLocationInformation* message and *NR-DL-AoD-ProvideAssistanceData* message from LMF via LPP [34] are delivered to the physical layer of UE.

If handover occurs while PRS-RSRP measurements are being performed then the UE shall complete the ongoing PRS-RSRP measurements session. The UE shall also meet the PRS-RSRP measurement requirements in this clause and measurement accuracy requirements in clause 10.1.24. However in this case the PRS-RSRP measurement period shall be as follows:

where

 is the number of times handover occurs during ;

 is the largest among all PRS layers;

is the time during which the PRS-RSRP measurement may not be possible due to handover; it can be up to Tinterrupt as defined in clause 6.1.

When the PRS-RSRP measurement is configured together with UE Rx-Tx time difference measurement, the UE behaviour at a serving cell change for the PRS-RSRP measurement is the same as the UE behaviour for the UE Rx-Tx time difference measurement specified in clause 9.9.4.5, and the PRS-RSRP measurement shall meet the accuracy requirements in clause 10.1.24.

When the PRS-RSRP measurement is configured together with RSTD measurement, the UE behaviour at a serving cell change for the PRS-RSRP measurement is the same as the UE behaviour for the RSTD measurement specified in clause 9.9.2.5, and the PRS-RSRP measurement shall meet the accuracy requirements in clause 10.1.24.

<End of Change 1>