**3GPP TSG-RAN4 Meeting #116 *R4-25xxxxx***

**Bengaluru, India, 25 – 29 August, 2025**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | 5908 | **rev** | 1 | **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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | (NR\_pos\_enh2-Perf) CR on test cases for PRS BWA | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2-Perf | | | | |  | ***Date:*** | | | 2025-08-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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 can be 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. Some TCs for PRS BWA are defined with the setup where one cell transmits PRS on 2 PFLs. Compared to other TCs with same setup, the descriptions about existence of 2 RF channels and one cell transmitting 2 PFLs on 2 RF channels are missing. 2. In some TCs, the BWA related descriptions about PRS measurement request are wrong and descriptions about assistance data are missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | In PRS BWA TCs in A.6.6.12.6, A.7.6.9.6, A.6.7.13.5, A.7.7.10.5,   1. Add descriptions about 2 PFLs being associated with 2 RF channels and being intra-band contiguous. 2. Correct descriptions about PRS measurement request and add descriptions about assistance data. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | TCs for PRS BWA are incorrect. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | A.6.6.12.6, A.7.6.9.6, A.6.7.13.5, A.7.7.10.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **x** |  | Test specifications | | | | TS 38.533 | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

A.6.6.12.6 NR RSTD measurement reporting delay test case for PRS aggregation in FR1 SA in RRC\_CONNECTED mode

A.6.6.12.6.1 Test Purpose and Environment

The purpose of the test is to verify that the RSTD measurement by aggregating PRS resources from two positioning frequency layers (PFLs) meets the measurement period requirements specified in clause 9.9.2.10 in an environment with AWGN propagation conditions in FR1.

The supported test configurations are specified in table A.6.6.12.6.1-1.

**Table A.6.6.12.6.1-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | 15 kHz SSB SCS, 20 MHz bandwidth per PFL, FDD duplex mode |
| 2 | 15 kHz SSB SCS, 20 MHz bandwidth per PFL, TDD duplex mode |
| 3 | 30 kHz SSB SCS, 50 MHz bandwidth per PFL, TDD duplex mode |
| NOTE: The UE is only required to be tested in one of the supported test configurations. | |

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the PCell. Cell 2 and Cell 3 are the neighbour cells. Each cell is associated with a different TRP/DL PRS ID in the *NR-DL-PRS-AssistanceData* [34]. Cell 1 transmissions other than DL PRS are allocated in RF channel #1. In addition, all cells/TRPs transmit DL PRS in two intra-band contiguous PFLs in RF channel #1 and RF channel #2. PFL1 is allocated within RF channel #1 and PFL2 is allocated within RF channel #2. Except for the frequency offset between them, both PFLs have identical PRS configuration.

The test consists of two consecutive time intervals, with duration of T1 and T2. During time duration T1, the UE shall not have any timing information of Cell 2 and Cell 3. All three cells transmit PRS resources on two positioning frequency layers during T2.

Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The *NR-DL-TDOA-ProvideAssistanceData* and *nr-DL-TDOA-RequestLocationInformation* as defined in TS 37.355 [34], clause 6.5.10, shall be provided to the UE during T1. The UE is capable of performing RSTD measurements by aggregating PRS resources from two PFLs and is configured by the LMF to perform measurements by aggregating the PRS resources from two positioning frequency layers via *nr-DL-PRS-JointMeasurementRequestedPFL-List*. The *NR-DL-TDOA-ProvideAssistanceData* message provided to the UE must include *NR-DL-PRS-AggregationInfo-r18* linking each PRS resource in PFL1 to the corresponding PRS resource in PFL2.

The last TTI containing the two messages shall be provided to the UE ΔT ms before the start of T2, where ΔT = 50 ms is the maximum processing time of the DL-TDOA assistance data and location information request.

The beginning of the time interval T2 shall be aligned with the beginning of the first measurement gap instance containing the PRS resources.

The UE is configured with measurement gap pattern ID # 24 or measurement gap pattern ID # 0 before T2.

The general test parameters are listed in table A.6.6.12.6.1-2, and cell specific test parameters are listed in table A.6.6.12.6.1-3.

<Texts without change are omitted>

<End of Change 1>

<Start of Change 2>

A.7.6.9.6 NR RSTD measurement reporting delay test case for PRS aggregation in FR2 SA in RRC\_CONNECTED mode

A.7.6.9.6.1 Test Purpose and Environment

The purpose of the test is to verify that the RSTD measurement performed by UE by aggregating PRS resources from two positioning frequency layers (PFLs) meets the requirements specified in clause 9.9.2.10 in an environment with AWGN propagation conditions in FR2 in standalone scenario when single positioning frequency layer is configured.

Supported test configurations are shown in table A.7.6.9.6.1-1.

**Table A.7.6.9.6.1-1: Supported test configurations for NR RSTD**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | 120 kHz SSB SCS, 200 MHz bandwidth per PFL, TDD duplex mode |

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the PCell. Cell 2 and Cell 3 are the neighbour cells. Each cell is associated with a different TRP/DL PRS ID in the *NR-DL-PRS-AssistanceData* [34]. Cell 1 transmissions other than DL PRS are allocated in RF channel #1. In addition, all cells/TRPs transmit DL PRS in two intra-band contiguous PFLs in RF channel #1 and RF channel #2. PFL1 is allocated within RF channel #1 and PFL2 is allocated within RF channel #2. Except for the frequency offset between them, both PFLs have identical PRS configuration.

The test consists of two consecutive time intervals, with duration of T1 and T2. During time duration T1, the UE shall not have any timing information of Cell 2 and Cell 3. All three cells transmit PRS resources on two positioning frequency layers during T2.

NOTE: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The *NR-DL-TDOA-ProvideAssistanceData* and *nr-DL-TDOA-RequestLocationInformation* as defined in TS 37.355 [34], clause 6.5.12.1, shall be provided to the UE during T1. The UE is capable of performing RSTD measurements by aggregating PRS resources from two PFLs and is configured by the LMF to perform measurements by aggregating the PRS resources from two positioning frequency layers via *nr-DL-PRS-JointMeasurementRequestedPFL-List*. The *NR-DL-TDOA-ProvideAssistanceData* message provided to the UE must include *NR-DL-PRS-AggregationInfo-r18* linking each PRS resource in PFL1 to the corresponding PRS resource in PFL2.

The last TTI containing the two messages shall be provided to the UE ΔT ms before the start of T2, where ΔT = 50 ms is the maximum processing time of the *DL-TDOA assistance* data and location information request.

The beginning of the time interval T2 shall be aligned with the beginning of the first measurement gap instance containing the PRS resources.

The UE is configured with measurement gap pattern ID # 24 or #13 before T2.

The general test parameters are listed in table A.7.6.9.6.1-2, and cell specific test parameters are listed in table A.7.6.9.6.1-3 during T1 and table A.7.6.9.6.1-4 during T2.

<Texts without change are omitted>

<End of Change 2>

<Start of Change 3>

A.6.7.13.5 NR RSTD measurement accuracy test case for PRS aggregation in FR1 SA in RRC\_CONNECTED mode

A.6.7.13.5.1 Test purpose and Environment

The purpose of the test is to verify that the RSTD measurement by aggregating PRS resoureces from two positioning frequency layers (PFLs) meets the measurement accuracy requirements specified in clause 10.1.23A.2 in an environment with AWGN propagation conditions.

The supported test configurations are specified in table A.6.7.13.5.1-1.

**Table A.6.7.13.5.1-1: Supported test configurations for PRS aggregation**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | 15 kHz SSB SCS, 20 MHz bandwidth per PFL, FDD duplex mode |
| 2 | 15 kHz SSB SCS, 20 MHz bandwidth per PFL, TDD duplex mode |
| 3 | 30 kHz SSB SCS, 50 MHz bandwidth per PFL, TDD duplex mode |
| NOTE: The UE is only required to be tested in one of the supported test configurations. | |

In the test there are two synchronous cells: Cell 1 and Cell 2. Cell 1 is the reference as well as the PCell. Cell 2 is a neighbour cell. Each cell is associated with a different TRP/DL PRS ID in the *NR-DL-PRS-AssistanceData* [34]. Cell 1 transmissions other than DL PRS are allocated in RF channel #1. In addition, all cells/TRPs transmit DL PRS in two intra-band contiguous PFLs in RF channel #1 and RF channel #2. PFL1 is allocated within RF channel #1 and PFL2 is allocated within RF channel #2. Except for the frequency offset between them, both PFLs have identical PRS configuration.

GP#24 is configured if UE supports MG#24, otherwise GP#0 is configured. The *NR-TDOA-ProvideAssistanceData* and *NR-TDOA-RequestLocationInformation* message as defined in TS 37.355 [34], shall be provided to the UE before the start of the test. The UE is capable of performing RSTD measurements by aggregating PRS resources from two PFLs and is configured by the LMF to perform measurements by aggregating the PRS resources from two positioning frequency layers via *nr-DL-PRS-JointMeasurementRequestedPFL-List*. The *NR-DL-TDOA-ProvideAssistanceData* message provided to the UE must include *NR-DL-PRS-AggregationInfo-r18* linking each PRS resource in PFL1 to the corresponding PRS resource in PFL2.

The test duration should be larger than the UE measurement period as defined in clause 9.9.2.

<Texts without change are omitted>

<End of Change 3>

<Start of Change 4>

A.7.7.10.5 NR RSTD measurement accuracy test case for PRS aggregation in FR2 SA in RRC\_CONNECTED mode

A.7.7.10.5.1 Test purpose and Environment

The purpose of the test is to verify that the RSTD measurement performed by UE by aggregating PRS resources from two positioning frequency layers (PFLs) meets the accuracy requirements specified in clause 10.1.23A.2 in an environment with AWGN propagation conditions.

The supported test configurations are specified in table A.7.7.10.5.1-1.

**Table A.7.7.10.5.1-1: Supported test configurations**

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | 120 kHz SSB SCS, 200 MHz bandwidth per PFL, TDD duplex mode |

In the test there are two synchronous cells: Cell 1 and Cell 2. Cell 1 is the reference as well as the PCell. Cell 2 is a neighbour cells. Each cell is associated with a different TRP/DL PRS ID in the *NR-DL-PRS-AssistanceData* [34]. Cell 1 transmissions other than DL PRS are allocated in RF channel #1. In addition, all cells/TRPs transmit DL PRS in two intra-band contiguous PFLs in RF channel #1 and RF channel #2. PFL1 is allocated within RF channel #1 and PFL2 is allocated within RF channel #2. Except for the frequency offset between them, both PFLs have identical PRS configuration.

GP#24 is configured if UE supports GP#24, otherwise, GP#13 is configured for the test. The UE is capable of performing RSTD measurements by aggregating PRS resources from two PFLs and is configured by the LMF to perform measurements by aggregating the PRS resources from two PFLs via *nr-DL-PRS-JointMeasurementRequestedPFL-List*. The *NR-DL-TDOA-ProvideAssistanceData* message provided to the UE must include *NR-DL-PRS-AggregationInfo-r18* linking each PRS resource in PFL1 to the corresponding PRS resource in PFL2. The *NR-TDOA-ProvideAssistanceData* and *NR-TDOA-RequestLocationInformation* message as defined in TS 37.355 [34], shall be provided to the UE before the start of the test.

The test duration should be larger than the UE measurement period as defined in clause 9.9.2.10.

<Texts without change are omitted>

<End of Change 4>