**3GPP TSG-RAN WG4 Meeting #116 *R4-2509277***

**Bengaluru , IN, 25th – 29th Aug, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.133** | **CR** | **Draft** | **rev** | **-** | **Current version:** | **19.1.0** |  |
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| *For* ***HE******LP*** *on using this form: comprehensive instructions can be found at  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:*** | Draft CR to TS 38.133 on general measurement requirement for R19 ATG | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_ATG\_enh-Core | | | | |  | ***Date:*** | | | 2025-08-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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. | | | | | | | | *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:*** | | The general measurement requirements for R19 ATG need to be introduced. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Revise general measurement requirements defined in TS 38.133 to include the impact of DL CA for R19 ATG according to the agreements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The general measurement requirements for R19 ATG would be missed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.1D | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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>

## 9.1D General measurement requirement for ATG

### 9.1D.1 Introduction

This clause contains general requirements on the ATG UE regarding measurement reporting in RRC\_CONNECTED state. The requirements are split in intra-frequency, inter-frequency, and L1-RSRP measurements requirements. These measurements may be used by the NG-RAN. The measurement quantities are defined in TS 38.215 [4], the measurement model is defined in TS 38.300 [10], TS 37.340 [17] and measurement accuracies are specified in clause 10. Control of measurement reporting is specified in TS 38.331 [2].

In the requirements of clause 9.1D, the exceptions for side conditions apply as follows:

- for the UE capable of CA but not configured with any SCell, the applicable exceptions for side conditions are specified in Annex B, clause B.3.2.1 for UE supporting CA in FR1;

- for the UE capable of CA and configured with at least one SCell, the applicable exceptions for side conditions are specified in Annex B, clause B.3.2.2for UE configured with CA in FR1;

### 9.1D.2 Measurement gap

If the UE requires measurement gaps to identify and measure intra-frequency cells and/or inter-frequency cells, and the UE does not support independent measurement gap patterns for different frequency ranges as specified in table 5.1-1 in [18, 19, 20], in order for the requirements in the following clauses to apply the network must provide a single per-UE measurement gap pattern for concurrent monitoring of all frequency layers.

During the per-UE measurement gaps an ATG UE, operating under SA (with single carrier or CA configured), is not required to conduct reception/transmission from/to the corresponding NR serving cells except the reception of signals used for RRM measurement(s).

UEs shall support the measurement gap patterns listed in table 9.1D.2-1 based on the applicability specified in table 9.1D.2-3. UE determines measurement gap timing based on gap offset configuration and measurement gap timing advance configuration provided by higher layer signalling as specified in TS 38.331.

Table 9.1D.2-1: Gap Pattern Configurations

|  |  |  |
| --- | --- | --- |
| Gap Pattern Id | Measurement Gap Length  (MGL, ms) | Measurement Gap Repetition Period  (MGRP, ms) |
| 0 | 6 | 40 |
| 1 | 6 | 80 |
| 2 | 3 | 40 |
| 3 | 3 | 80 |
| 4 | 6 | 20 |
| 5 | 6 | 160 |
| 6 | 4 | 20 |
| 7 | 4 | 40 |
| 8 | 4 | 80 |
| 9 | 4 | 160 |
| 10 | 3 | 20 |
| 11 | 3 | 160 |

Table 9.1D.2-2: Void

Table 9.1D.2-3: Applicability for Gap Pattern Configurations supported by the UE with NR standalone operation (with single carrier and NR CA configuration)

|  |  |  |  |
| --- | --- | --- | --- |
| Measurement gap pattern configuration | Serving cell | Measurement Purpose | Applicable Gap Pattern Id |
| Per-UE measurement gap | FR1 | FR1 | 0-11 |
| NOTE 1: Void  NOTE 2: Void  NOTE 3: Void  NOTE 4: If per-UE measurement gap is configured with MG timing advance of TMG ms, the measurement gap starts at time TMG ms advanced to the end of the latest subframe occurring immediately before the configured measurement gap among all serving cells subframes. TMG is the MG timing advance value provided in *mgta* according to [2].  In determining the measurement gap starting point, UE shall use the DL timing of the latest subframe occurring immediately before the configured measurement gap among serving cells. | | | | |

For single carrier or CA with aligned frame boundaries,

For NR standalone operation (with single carrier or NR CA), total interruption time on a serving cell during MGL is defined when MGL(N) = 6 ms, 4 ms, 3 ms.

 (a) Measurement gap with MGL = N(ms) with MG timing advance of 0 ms for all serving cells in synchronous NR standalone operation (with single carrier and NR CA configuration)

 (b) Measurement gap with MGL = N(ms) with MG timing advance of 0.5 ms for all serving cells in synchronous NR standalone operation (with single carrier and NR CA configuration)

Figure 9.1D.2-1: Measurement GAP and total interruption time on serving cells for NR standalone operation (with single carrier and NR CA)

The corresponding total number of interrupted slots on serving cells is listed in table 9.1D.2-4 for all serving cells in synchronous NR standalone (with single carrier and NR CA configuration).

Table 9.1D.2-4: Total number of interrupted slots on all serving cells during MGL for Synchronous NR standalone operation (with single carrier and NR CA configuration) with per-UE measurement gap

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NR | Total number of interrupted slots on serving cells | | | | | |
| SCS | When MG timing advance of 0 ms is applied | | | When MG timing advance of 0.5 ms is applied | | |
| (kHz) | MGL=6 ms | MGL=4 ms | MGL=3 ms | MGL=6 ms | MGL=4 ms | MGL=3 ms |
| 15 | 6 | 4 | 3 | 7Note3 | 5Note3 | 4Note3 |
| 30 | 12 | 8 | 6 | 12 | 8 | 6 |
| NOTE 1: For Gap Pattern ID 0, 1, 2 and 3, total number of interrupted subframes on MCG is MGL subframes when MG timing advance of 0 ms is applied, and (MGL+1) subframes when MG timing advance of 0.5 ms is applied.  NOTE 2: Void  NOTE 3: Non-overlapped half-slots occur before and after the measurement gap. Whether a Rel-15 UE can receive and/or transmit in those half-slots is up to UE implementation. | | | | | | |

It is up to UE implementation whether or not the UE is able to conduct transmission in the following slot(s),

- when MGTA is not applied, in the L consecutive UL slots with respect to the SCS of the UL carrier with the same slot indices as the DL slots occurring immediately after measurement gap

- when MGTA is applied and the SCS of the UL carrier is other than 15 kHz, in the L consecutive UL slots with respect to the SCS of the UL carrier with the same slot indices as the DL slots occurring immediately after measurement gap

- when MGTA is applied and the SCS of the UL carrier is 15 kHz, in the L consecutive UL slots with respect to the SCS of the UL carrier with the same slot indices as the DL slots occurring immediately after the slot partially overlapped with measurement gap

where UL slot denotes that all the symbols in the slot are uplink symbols, and L=1 if  for the UL transmission is less than the length of one slot; L=2 otherwise.

NOTE: Network is supposed to take into account the possible difference between the estimated TA at network and actual TA at UE when scheduling UE in the above slot(s).

#### 9.1D.2.1a SA: Measurement Gap Sharing

Measurement gap sharing shall be applied when UE requires measurement gaps to identify and measure cells on intra-frequency carriers or when SMTC configured for intra-frequency measurement are fully overlapping with per-UE measurement gaps, and when UE requires measurement gaps to identify and measure cells on inter-frequency carriers for both SSB and CSI-RS based L3 measurement, or when all of SMTC configured for inter-frequency SSB based measurement without measurement gaps are fully overlapping with per-UE measurement gaps.

When network signals “01”, “10” or “11” with RRC parameter *MeasGapSharingScheme* [2] and the value of X is defined as in table 9.1D.2.1A-1, and

- Kintra = 1 / X \* 100,

- Kinter = 1 / (100 – X) \* 100,

When network signals “00” indicating equal splitting gap sharing, X is not applied.

The RRC parameter *MeasGapSharingScheme* shall be applied to the calculation of carrier specific scaling factor as specified in clause 9.1D.5.2.2.

Table 9.1D.2.1A-1: Value of parameter X for NR standalone measurement gap sharing

|  |  |
| --- | --- |
| *measGapSharingScheme* | Value of X (%) |
| ‘00’ | Equal splitting |
| ‘01’ | 25 |
| ‘10’ | 50 |
| ‘11’ | 75 |
| NOTE: It is left to UE implementation to determine which measurement gap sharing scheme in the table to be applied, when *MeasGapSharingScheme* is absent and there isno stored value in the field. | |

### 9.1D.3 UE Measurement capability

#### 9.1D.3.1 SA: Monitoring of multiple layers using gaps

When monitoring of multiple inter-frequency NR carriers is configured by PCell, the UE shall be capable of performing one measurement of the configured measurement type (SS-RSRP, SS-RSRQ, SS-SINR, CSI-RSRP, CSI-RSRQ, CSI-SINR etc.) of detected cells on all the layers configured for measurements by the PCell.

#### 9.1D.3.2 SA: Maximum allowed layers for multiple monitoring

The UE shall be capable of monitoring at least:

- Depending on UE capability, 7 NR SSB inter-frequency carriers configured by PCell, and

- Depending on UE capability, 8 NR inter-frequency carriers including SSB and CSI-RS in total configured by PCell.

The number of SSB frequency layers equals to the total number of MOs with

- *ssb-ConfigMobility* configured, or

- *ssb-ConfigMobility* not configured but *csi-rs-ResourceConfigMobility* configured with *associatedSSB*.

If *ssbfrequency, smtc1, smtc2* and *ssbSubcarrierSpacing* are same in multiple MOs, the multiple MOs are counted as one SSB frequency layer.

The number of CSI-RS frequency layers equals to the number of MOs with *csi-rs-ResourceConfigMobility* configured assuming single MO is configured per frequency layer.

### 9.1D.4 Void

### 9.1D.5 Carrier-specific scaling factor

This clause specifies the derivation of carrier-specific scaling factor (CSSF) values, which scales the measurement delay requirements given in clause 9.2D, 9.3D, and CSI-RS based L3 measurement in clause 9.10D when UE is configured to monitor multiple measurement objects. The CSSF values are categorized into CSSFoutside\_gap,i andCSSFwithin\_gap,i, for the measurements conducted outside measurement gaps and within measurement gaps, respectively.

#### 9.1D.5.1 Monitoring of multiple layers outside gaps

The carrier-specific scaling factor CSSFoutside\_gap,i for measurement object *i* derived in this chapter is applied to following measurement types:

- SSB-based intra-frequency measurement with no measurement gap in clause 9.2D.5, when none of the SMTC occasions of this intra-frequency measurement object are overlapped by the measurement gap.

- SSB-based intra-frequency measurement with no measurement gap in clause 9.2D.5, when part of the SMTC occasions of this intra-frequency measurement object are overlapped by the measurement gap.

- CSI-RS based intra-frequency measurement in clause 9.10D.2, when none of CSI-RS resources for L3 measurement of this intra-frequency measurement object are overlapped by the measurement gap.

- CSI-RS based intra-frequency measurement in clause 9.10D.2, when all CSI-RS resources for L3 measurement of this intra-frequency measurement object are partially overlapped by the measurement gap.

- SSB-based inter-frequency measurement with no measurement gap in clause 9.3D.9, when none of the SMTC occasions of this inter-frequency measurement object are overlapped by the measurement gap, if UE supports *interFrequencyMeas-NoGap-r16* and the flag *interFrequencyConfig-NoGap-r16* is configured by the Network.

- SSB-based inter-frequency measurement with no measurement gap in clause 9.3D.9, when part of the SMTC occasions of this inter-frequency measurement object are overlapped by the measurement gap, if UE supports *interFrequencyMeas-NoGap-r16* and the flag *interFrequencyConfig-NoGap-r16* is configured by the Network.

The UE is expected to conduct the measurement of this measurement object *i* only outside the measurement gaps.

The number of frequency layers for SSB measurements shall include the total number of MOs with

- *ssb-ConfigMobility* configured, or

- *ssb-ConfigMobility* not configured but *csi-rs-ResourceConfigMobility* configured with *associatedSSB*.

If *ssbfrequency, smtc1, smtc2* and *ssbSubcarrierSpacing* are same in multiple MOs, the multiple MOs are counted as one SSB frequency layer.

If the higher layer signaling in TS 38.331 [2] of *smtc2* is present and *smtc1* is fully overlapping with measurement gaps and *smtc2* is partially overlapping with measurement gaps, CSSFoutside\_gap,i and requirements derived from CSSFoutside\_gap,i are not specified.

##### 9.1D.5.1.1 Void

##### 9.1D.5.1.2 SA mode: carrier-specific scaling factor for SSB-based, CSI-RS based L3 measurements performed outside gaps

The carrier-specific scaling factor CSSFoutside\_gap,i for intra-frequency SSB-based measurements, inter-frequency SSB-based measurements performed outside measurements gaps, intra-frequency CSI-RS L3 measurement with no measurement gap is specified in table 9.1D.5.1.2-1.

Table 9.1D.5.1.2-1: CSSFoutside\_gap,i scaling factor for SA mode

|  |  |  |  |
| --- | --- | --- | --- |
| Scenario | *CSSF*outside\_gap,i for FR1 PCC | *CSSF*outside\_gap,i for FR1 SCC | *CSSF*outside\_gap,i for inter-frequency MO with no measurement gap |
| **FR1 single carrier** | 1+NPCC\_CSIRS | N/A | Y |
| **FR1 only CA** | 1+NPCC\_CSIRS | NSCC\_SSB +Y +2x NSCC\_CSIRS | NSCC\_SSB +Y +2x NSCC\_CSIRS |
| NOTE 1: Y is the number of configured inter-frequency MOs without MG that are being measured outside of MG; otherwise, it is 0.  NOTE 2: NPCC\_CSIRS=1 if PCC is with either both SSB and CSI-RS based L3 configured or only CSI-RS based L3 measurement configured; otherwise, NPCC\_CSIRS =0.  NOTE 3: CSSFoutside\_gap,i =1 if only one SCell is configured and no inter-frequency MO without gap and only SSB based L3 measurement is configured on SCC; CSSFoutside\_gap,i =2 if only one SCell is configured and no inter-frequency MO without gap and either both SSB and CSI-RS based L3 configured or only CSI-RS based L3 measurement is configured on SCC.  NOTE 4: NSCC\_CSIRS=Number of configured SCell(s) with either both SSB and CSI-RS based L3 measurement configured or only CSI-RS based L3 measurement configured  NOTE 5: NSCC\_SSB=Number of configured SCell(s) with only SSB based L3 measurement configured, which is measured without MG. | | | |

#### 9.1D.5.2 Monitoring of multiple layers within gaps

The carrier-specific scaling factor CSSFwithin\_gap,i for a measurement object *i* derived in this chapter is applied to following measurement types:

- SSB-based intra-frequency measurement object with no measurement gap in clause 9.2D.5, when all of the SMTC occasions of this intra-frequency measurement object are overlapped by the measurement gap.

- SSB-based intra-frequency measurement object with measurement gap in clause 9.2D.6.

- CSI-RS based inter-frequency measurement in clause 9.10D.3, when CSI-RS resources for L3 measurement of this inter-frequency measurement object are overlapped by the measurement gap.

- CSI-RS based inter-frequency measurement in clause 9.10D.3, when CSI-RS resources for L3 measurement of this inter-frequency measurement object are partially overlapped by the measurement gap.

- SSB-based inter-frequency measurement object with measurement gap in clause 9.3D.4.

- SSB-based inter-frequency measurement object without measurement gap for UE capable of *interFrequencyMeas-NoGap* in clause 9.3D.9, when

- all of the SMTC occasions of this inter-frequency measurement object are overlapped by the measurement gap, or

- part of the SMTC occasions of this inter-frequency measurement object are overlapped by the measurement gap, but the flag *interFrequencyConfig-NoGap-r16* is not configured by the Network.

The UE is expected to conduct the measurement of this measurement object *i* only within the measurement gaps.

If the higher layer signaling in TS 38.331 [2] of *smtc2* is present and *smtc1* is fully overlapping with measurement gaps and *smtc2* is partially overlapping with measurement gaps, CSSFwithin\_gap,i and requirements derived from CSSFoutside\_gap,i are not specified.

Number of SSB layers shall include SSB for mobility and that as associated SSB for CSI-RS mobility. The ssbfrequency is counted only once if the ssbfrequency for mobility and associated SSB are the same, or ssbfrequency and smtc in multiple MOs are the same.

SSB-based measurement and CSI-RS based measurement for mobility configured in the same measurement object are considered as different layers.

##### 9.1D.5.2.1 Void

##### 9.1D.5.2.2 SA mode: carrier-specific scaling factor for SSB, CSI-RS-based L3 measurements performed within gaps

When one or more measurement objects are monitored within measurement gaps, the carrier specific scaling factor for a target measurement object with index *i* is designated as CSSFwithin\_gap,i and is derived as described in this clause.

For each measurement gap *j*, count the total number of intra-frequency measurement objects and inter-frequency measurement objects on all frequency layers which are candidates to be measured within the gap *j*.

- An NR measurement object with SSB measurement configured is a candidate to be measured in a gap if its SMTC duration is fully covered by the MGL excluding RF switching time. For intra-frequency NR measurement objects, if the higher layer in TS 38.331 [2] signaling of *smtc2* is configured, the assumed periodicity of SMTC occasions corresponds to the value of higher layer parameter *smtc2*; otherwise the assumed periodicity of SMTC occasions corresponds to the value of higher layer parameter *smtc1*.

- An NR measurement object with CSI-RS measurement configured is a candidate to be measured in a gap if the window confining all CSI-RS resources is fully covered by the MGL excluding RF switching time.

- For UEs which are configured with per UE gaps the counting is done on a per UE basis.

- Mintra,i,j: Number of intra-frequency measurement objects, including both SSB and CSI-RS based, which are candidates to be measured in gap *j* where the measurement object *i* is also a candidate. Otherwise Mintra,i,j equals 0.

- Minter,i,j : Number of NR inter-frequency layers including both SSB and CSI-RS based, which are candidates to be measured in gap *j* where the measurement object *i* is also a candidate. Otherwise Minter,i,j equals 0.

- Mtot,i,j = Mintra,i,j + Minter,i,j : Total number of intra-frequency layers, inter-frequency, which are candidates to be measured in gap *j* where the measurement object *i* is also a candidate. Otherwise Mtot,i,j equals 0.

The carrier specific scaling factor CSSFwithin\_gap,i is given by:

If *measGapSharingScheme* is equal sharing, CSSFwithin\_gap,i= max(ceil(Ri×Mtot,i,j)), where *j*=0…(160/MGRP)-1

If *measGapSharingScheme* is not equal sharing and

- measurement object *i* is an intra-frequency measurement object, CSSFwithin\_gap,i is the maximum among

- ceil(Ri×Kintra×Mintra,i,j) in gaps where Minter,i,j≠0, where *j*=0…(160/MGRP)-1

- ceil(Ri×Mintra,i,j) in gaps where Minter,i,j=0, where *j*=0…(160/MGRP)-1

- measurement object *i* is an inter-frequency measurement object on any one frequency layer, CSSFwithin\_gap,i is the maximum among

- ceil(Ri×Kinter×Minter,i,j) in gaps where Mintra,i,j ≠0, where *j*=0…(160/MGRP)-1

- ceil(Ri×Minter,i,j)in gaps where Mintra,i,j=0, where *j*=0…(160/MGRP)-1

Where Ri is the maximal ratio of the number of measurement gap where measurement object *i* is a candidate to be measured over the number of measurement gap where measurement object *i* is a candidate to be measured.

### 9.1D.6 Void

### 9.1D.7 Pre-configured measurement gap

#### 9.1D.7.1 Introduction

A UE capable of Pre-configured measurement gap (Pre-MG) pattern can be configured with a Pre-MG pattern via RRC signalling [2].

The gap interruption requirements in clause 9.1D.2 apply to Pre-MG when Pre-MG is activated, and no gap interruption is expected when Pre-MG is deactivated.

- The requirements apply for NR standalone operation with single carrier and NR CA.

#### 9.1D.7.2 Requirements applicability

The requirements related to pre-configured measurement gap apply provided:

- UE indicates support of *preconfiguredUE-AutonomousMeasGap* [2] and/or *preconfiguredNW-ControlledMeasGap* [2], and

- a single per-UE measurement gap is pre-configured by the network, and

- one of measurement gap patterns among measurement gap patterns #0 ~ #11 is configured for pre-configured measurement gap, and

- UE is in NR SA with single carrier or with NR CA.

A measurement gap is configured as pre-configured measurement gap if *preConfigInd* is indicated by network in the configuration message of the measurement gap.

If UE indicates support of only *preconfiguredNW-ControlledMeasGap* [2], UE can expect the network to configure *preConfGapStatus*.

If a measurement gap is configured as pre-configured measurement gap, the applicability of measurement gap patterns is defined in table 9.1D.2-3.

If the Pre-MG status changes during a measurement period of a measurement that can be performed without and within measurement gaps, the UE is allowed to restart the measurement.

If the Pre-MG status changes from activated to deactivated during a measurement period of a measurement that can only be performed within measurement gaps, the measurement requirements do not apply.

#### 9.1D.7.3 Requirements

Any of the measurement Gap pattern defined in table 9.1D.2-1 can be configured as Pre-MG pattern.

The UE can determine the Pre-MG status based on autonomous activation/deactivation mechanism or based on network-controlled activation/deactivation mechanism.

A UE capable of both autonomous and network-controlled mechanisms for activation/deactivation of Pre-MG pattern will not use autonomous rules to determine the activation/deactivation status of the pre-configured MG if the network provides the activation/deactivation status via RRC indication *preConfGapStatus* for all the DL BWPs of all the activated CCs, and for all the deactivated SCCs.

##### 9.1D.7.3.1 Requirements for autonomous activation/deactivation mechanism

Requirements in this clause apply when autonomous mechanism [2] is used for activation/deactivation of Pre-MG pattern.

The UE can autonomously change the Pre-MG status from activation to deactivation or vice versa based on any of the following triggering conditions listed below. The UE shall also autonomously determine the Pre-MG status based on all the concurrent triggering conditions occurring jointly:

- DCI, timer or RRC based active BWP switching,

- Activation/deactivation of SCell(s),

- Addition/removal of any measurement object(s)

- Addition/release/change of a SCell in carrier aggregation

The UE shall autonomously determine the status of the per-UE Pre-MG pattern as deactivated immediately after the configuration of the per-UE Pre-MG pattern or when any of the triggering conditions above is satisfied provided that all the configured measurements can be performed without measurement gaps.

A measurement can be performed by the UE without measurement gaps if any of the following conditions is met:

- The UE is configured with SSB based intra-frequency measurements, and the conditions defined for SSB based intra-frequency measurement without gaps in clause 9.2D.1 are met, or

- The UE is configured with SSB based inter-frequency measurements, and the conditions defined for SSB based inter-frequency measurement without gaps in clause 9.3D.1 are met, or

- The UE is configured with CSI-RS based intra-frequency measurements.

The UE shall autonomously determine the status of the per-UE Pre-MG pattern as activated immediately after the configuration of the per-UE Pre-MG pattern or when any of the triggering conditions above is satisfied provided that at least one of the configured measurements cannot be performed without measurement gaps.

A measurement cannot be performed by the UE without measurement gaps if any of the following conditions is met:

- The UE is configured with SSB based intra-frequency measurements, and the conditions defined for SSB based intra-frequency measurement without gaps in clause 9.2D.1 are not met, or

- The UE is configured with SSB based inter-frequency measurements, and the conditions defined for SSB based inter-frequency measurement without gaps in clause 9.3D.1 are not met, or

- The UE is configured with CSI-RS based inter-frequency measurements.

##### 9.1D.7.3.2 Requirements for network-controlled activation/deactivation mechanism

The requirements in this clause apply when network-controlled mechanism [2] is used for activation/deactivation of Pre-MG pattern.

For per-UE Pre-configured MG,

- the UE determines that the Pre-configured MG is activated if *preConfGapStatus* is set to ‘1’ for the corresponding gap ID for the active DL BWP of any of the activated CCs, or if *preConfGapStatus* is set to ‘1’ for the corresponding gap ID for any of the deactivated SCCs,

- otherwise, the UE determines that the Pre-configured MG is deactivated

##### 9.1D.7.3.3 Requirements for reception/transmission during activation/deactivation

The requirements in this clause apply when autonomous mechanism or network-controlled mechanism is used for activation/deactivation [2] of Pre-MG pattern.

If per-UE Pre-MG pattern is activated then the UE is not required to conduct reception/transmission from/to the corresponding serving cells during the gap occasion according to the same principles as described for per-UE measurement gaps in clause 9.1D.2. Otherwise, the UE can be scheduled for reception/transmission of signals in all the serving cells during the gap occasion.

### 9.1D.8 Capabilities for Support of Event Triggering and Reporting Criteria

#### 9.1D.8.1 Introduction

This clause contains requirements on UE capabilities for support of event triggering and reporting criteria. As long as the measurement configuration does not exceed the requirements stated in clause 9.1D.8.2, the UE shall meet all other performance requirements defined in clause 9 and clause 10.

The UE can be requested to make measurements under different measurement identities defined in TS 38.331 [2]. Each measurement identity corresponds to either event-based reporting, periodic reporting, or no reporting. In case of event-based reporting, each measurement identity is associated with an event triggering criterion. In case of periodic reporting, a measurement identity is associated with one periodic reporting criterion. In case of no reporting, a measurement identity is associated with one no reporting criterion.

The purpose of this clause is to set some limits on the number of different event triggering, periodic, and no reporting criteria the UE may be requested to track in parallel.

#### 9.1D.8.2 Requirements

In this clause a reporting criterion corresponds to either one event (in the case of event-based reporting), or one periodic reporting criterion (in case of periodic reporting), or one no reporting criterion (in case of no reporting). For event-based reporting, each instance of event, with the same or different event identities, is counted as separate reporting criterion in table 9.1D.8.2-1.

The UE shall be able to support in parallel per category up to Ecat reporting criteria according to table 9.1D.8.2-1. For the measurement categories belonging to intra-frequency, inter-frequency, the UE need not support more than the total number of reporting criteria as follows:

- For UE configured with SA operation mode: , where

 is the total number of NR reporting criteria according to table 9.1D.8.2-1, and n is the number of configured NR serving frequencies, including PCell and SCell carrier frequencies.

Table 9.1D.8.2-1: Requirements for reporting criteria per measurement category

|  |  |  |
| --- | --- | --- |
| Measurement category | Ecat | Note |
| Intra-frequency Note 1,2 | 9 | Events for any one or a combination of intra-frequency SS-RSRP, SS-RSRQ, SS-SINR, CSI-RSRP, CSI-RSRQ, and CSI-SINR for NG-RAN intra-frequency cells |
| Inter-frequency Note 2 | 10 | Events for any one or a combination of inter-frequency SS-RSRP, SS-RSRQ, SS-SINR, CSI-RSRP, CSI-RSRQ, and CSI-SINR for NG-RAN inter-frequency cells |
| NOTE 1: When the UE is configured with SCell carrier frequencies, Ecat for Intra-frequency is applied per corresponding NR serving frequency.  NOTE 2: Applicable for UE configured with SA NR operation mode. | | |

### 9.1D.9 Minimum requirement at transitions

When the measurement on one intra-frequency measurement object transitions from measurements performed outside gaps to measurements performed within gaps or vice versa during one measurement period, the cell identification and measurement period requirements with the longer delay apply.

The carrier-specific scaling factor specified in clause 9.1D.5 that applies to the other impacted measurement objects will also apply based on the longer measurement or cell identification delay before or after the transition.

When the UE transitions between DRX and non-DRX or when DRX cycle periodicity changes, the cell identification and measurement period requirements apply based on the longer delay before or after the transition.

Subsequent to this measurement period, the cell identification and measurement period requirements on each measurement object are corresponding to the second mode after transition.

<End of Change 1>