**3GPP TSG-RAN WG4 Meeting #111 *R4-240xxxx***

**Fukuoka City, Fukuoka, Japan, 20th - 24th May**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **4419** | **rev** |  | **Current version:** | **17.13.0** |  |
|  | | | | | | | | |
| *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 |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Draft CR on Rel-17 NCSG requirements (Rel-17 spec) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | OPPO | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_MG\_enh-Core | | | | |  | ***Date:*** | | | 2024-05-13 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | The following issues are identified for NCSG requirements in clause 9.1.9:   * For the applicabile measurement object in caluse 9.1.9.2, CSI-RS is missed. * NCSG pattern #24 is used in Table 9.1.9.3-2 but it is not defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Correct the above issues and some typos. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The NCSG requirement will be incorrect. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.1.9.2 9.1.9.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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--------------**

#### 9.1.9.2 Requirements applicability

Requirements in clause 9.1.9 apply for UE capable of NCSG in standalone NR in both FR1 and FR2 (including FR1+FR2 CA), provided UE is configured with only NCSG and no other measurement gap is configured, and UE is configured with

SSB based intra-frequency measurement (including measurement on de-activated SCC and measurement on dormant SCell), and/or

SSB based inter-frequency measurement, and/or

Inter-RAT E-UTRAN measurement.

Requirements for the following measurements do not apply if UE is configured with NCSG.

CSI-RS based intra-frequency measurement, or

CSI-RS based inter-frequency measurement, or

Inter-RAT GSM measurement, or

Inter-RAT UTRAN measurement, or

PRS measurement.

9.1.9.3 Requirements

The UE shall support NCSG patterns defined in Table 9.1.9.3-1 that are relevant to the UE’s measurement capabilities. ML is the measurement length. During the VIL1 and VIL2, the UE is not expected to transmit and receive any data. Where, VIL1 is the visible interruption length before the ML and VIL2 is the visible interruption length after the ML. During ML, whether the UE is expected to transmit and receive data on the corresponding serving carrier(s) depends on the scheduling restriction requirements specified in clauses 9.2.7.3, 9.3.10.3, 9.4.2.5 and 9.4.3.5. The NCSG parameters VIL1, ML, VIL2 and VIRP are illustrated in Figure 9.1.9.3-1. The applicability of the NCSG patterns in Table 9.1.9.3-1 is specified in Table 9.1.9.3-2.

**VIL1**

**VIL2**

**ML**

**…**

**…**

**VIL1**

**VIL2**

**Time**

**VIRP**

**ML**

**Figure 9.1.9.3-1: Illustration of NCSG parameters: VIL1, ML, VIL2 and VIRP**

Table 9.1.9.3-1: NCSG Configurations supported by the UE

|  |  |  |
| --- | --- | --- |
| NCSG Pattern Id | Measurement Length during which there is no gap (ML, ms) | Visible interruption Repetition Period  (VIRP, ms) |
| 0 | 5 | 40 |
| 1 | 5 | 80 |
| 2 | 2 | 40 |
| 3 | 2 | 80 |
| 4 | 5 | 20 |
| 5 | 5 | 160 |
| 6 | 3 | 20 |
| 7 | 3 | 40 |
| 8 | 3 | 80 |
| 9 | 3 | 160 |
| 10 | 2 | 20 |
| 11 | 2 | 160 |
| 12 | 5 | 20 |
| 13 | 5 | 40 |
| 14 | 5 | 80 |
| 15 | 5 | 160 |
| 16 | 3 | 20 |
| 17 | 3 | 40 |
| 18 | 3 | 80 |
| 19 | 3 | 160 |
| 20 | 1 | 20 |
| 21 | 1 | 40 |
| 22 | 1 | 80 |
| 23 | 1 | 160 |

Table 9.1.9.3-2: Applicability for NCSG pattern configurations supported by the UE for NR standalone operation with single carrier or NR CA configuration

|  |  |  |  |
| --- | --- | --- | --- |
| NCSG pattern configuration | Serving cell | Measurement Purpose NOTE 2 | Applicable NCSG Pattern Id |
|  | FR1, or  FR1 + FR2 | E-UTRA | 0,1,2,3 |
|  |  | FR1 and/or FR2 | 0-11 |
|  |  | E-UTRA and FR1 and/or FR2 | 0, 1, 2, 3, 4, 6, 7, 8,10 |
| Per-UE NCSG | FR2 | E-UTRA only | 0,1,2,3 |
|  |  | FR1 only | 0-11 |
|  |  | FR1 and FR2 | 0-11 |
|  |  | E-UTRA and FR1 and/or FR2 | 0, 1, 2, 3, 4, 6, 7, 8,10 |
|  |  | FR2 only | 12-23 |
|  | FR1 if configured | E-UTRA only | 0,1,2,3 |
|  | FR2 if configured |  | No gap |
|  | FR1 if configured | FR1 only | 0-11 |
|  | FR2 if configured |  | No gap |
|  | FR1 if configured | FR2 only | No gap |
| Per-FR NCSG | FR2 if configured |  | 12-23 |
|  | FR1 if configured | E-UTRA and | 0, 1, 2, 3, 4, 6, 7, 8,10 |
|  | FR2 if configured | FR1 | No gap |
|  | FR1 if configured | FR1 and FR2 | 0-11 |
|  | FR2 if configured |  | 12-23 |
|  | FR1 if configured | E-UTRA and | 0, 1, 2, 3, 4, 6, 7, 8,10 |
|  | FR2 if configured | FR2 | 12-23 |
|  | FR1 if configured | E-UTRA and  FR1 and FR2 | 0, 1, 2, 3, 4, 6, 7, 8,10 |
|  | FR2 if configured | 12-23 |
| NOTE 1: When E-UTRA inter-RAT RSTD measurements are configured and the UE requires NCSG for performing such measurements, only NCSG Pattern #0 can be used.  NOTE 2: Measurement purpose which includes E-UTRA measurements includes also inter-RAT E-UTRA RSRP and RSRQ measurements for E-CID.  NOTE 3: If per-UE NCSG is configured with MG timing advance of TMG ms, the NCSG starts at time TMG ms advanced to the end of the latest subframe occurring immediately before the configured NCSG among all serving cells subframes.  If per-FR NCSG for FR1 is configured with MG timing advance of TMG ms, the NCSG for FR1 starts at time TMG ms advanced to the end of the latest subframe occurring immediately before the configured NCSG among serving cells subframes in FR1.  If per-FR NCSG for FR2 is configured with MG timing advance of TMG ms, the NCSG for FR2 starts at time TMG ms advanced to the end of the latest subframe occurring immediately before the configured NCSG among serving cells subframes in FR2.  TMG is the MG timing advance value provided in *mgta* according to [2].  In determining the NCSG starting point, UE shall use the DL timing of the latest subframe occurring immediately before the configured NCSG among serving cells.  NOTE 4: For UE only supporting *ncsg-MeasGapNR-Patterns-r17* for any NCSG patterns among NCSG pattern # 2-11, the corresponding NCSG patterns are not applicable to measurement of E-UTRA. | | | |

**------------ END OF CHANGE 1--------------**