**3GPP TSG-RAN WG4 Meeting #1111 R4-240xxxx**

**Fukuoka City, Fukuoka, Japan, 20th – 24th May, 2024**

**Title:** [draft] WF on Rel-17 NCSG

**Agenda Item:** 4.4

**Source: OPPO**

**Document for:** Approval

# Background

**Ambiguity #1:**

* When both the serving cells and measurement purpose are in FR2 only, and the per-UE gap (pattern #12-25) is configured, the switching time is 0.25ms rather than 0.5ms.
* When both the serving cells and measurement purpose are in FR2 only, and the per-UE NCSG (patterns #12-23) is configured, VIL is defined as 1ms in current spec, which is not aligned with the principle of RF switching time for the corresponding MG pattern.

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**Ambiguity #2:**

* For current Rel-17 NCSG patterns, only ML and VIRP are considered and VIL is not considered as a part of NCSG pattern, where MLNCSG is derived by MGLlegacy - 2\*RRT(switching time) for the corresponding MG patterns as illustrated in the table above. Then, some NCSG patterns are exactly the same, for example NCSG pattern #0 and #13, #1 and #14, etc.

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| MG pattern | NCSG pattern |
| Gap Pattern Id | Measurement Gap Length (MGL, ms) | Measurement Gap Repetition Period(MGRP, ms) | NCSG Pattern Id | Measurement Length during which there is no gap (ML, ms) | Visible interruption Repetition Period(VIRP, ms) |
| 0 | 6 | 40 | 0 | 5 | 40 |
| 1 | 6 | 80 | 1 | 5 | 80 |
| 2 | 3 | 40 | 2 | 2 | 40 |
| 3 | 3 | 80**ML=MGL-2\*0.5ms** | 3 | 2 | 80 |
| 4 | 6 | 20 | 4 | 5 | 20 |
| 5 | 6 | 160 | 5 | 5 | 160 |
| 6 | 4 | 20 | 6 | 3 | 20 |
| 7 | 4 | 40 | 7 | 3 | 40 |
| 8 | 4 | 80 | 8 | 3 | 80 |
| 9 | 4 | 160 | 9 | 3 | 160 |
| 10 | 3 | 20 | 10 | 2 | 20 |
| 11 | 3 | 160 | 11 | 2 | 160 |
| 12 | 5.5 | 20 | 12 | 5 | 20 |
| 13 | 5.5 | 40 | 13 | 5 | 40 |
| 14 | 5.5 | 80 | 14 | 5 | 80 |
| 15 | 5.5 | 160**ML=MGL-2\*0.25ms** | 15 | 5 | 160 |
| 16 | 3.5 | 20 | 16 | 3 | 20 |
| 17 | 3.5 | 40 | 17 | 3 | 40 |
| 18 | 3.5 | 80 | 18 | 3 | 80 |
| 19 | 3.5 | 160 | 19 | 3 | 160 |
| 20 | 1.5 | 20 | 20 | 1 | 20 |
| 21 | 1.5 | 40 | 21 | 1 | 40 |
| 22 | 1.5 | 80 | 22 | 1 | 80 |
| 23 | 1.5 | 160 | 23 | 1 | 160 |

# Way forward

**Issue 1: Rel-17 NCSG clarification**

* FFS whether and how to update VIL requirements in case of per-UE NCSG pattern #12-23 is configured
* FFS whether and how to distinguish NCSG pattern #0-11 and NCSG pattern #12-23.
	+ Option 1: clarify VIL in Table 9.1.9.3-1: NCSG Configurations supported by the UE.
	+ Option 2: modify VIL specific to NCSG patterns, e.g. Table 9.1.9-1 for NCSG pattern #0-11 and Table 9.1.9-2 for NCSG pattern #12-23.





# References

[1] R4-2407873, Discussion on Rel-17 NCSG maintenance issues, OPPO, RAN4 #111

[2] R4-2407874, CR on Rel-17 NCSG requirements, OPPO, RAN4 #111