**3GPP TSG-RAN WG4 Meeting #116 R4-25xxxxx**

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

**Agenda Item:** 7.29.1

**Source:** Moderator (Qualcomm Incorporated)

**Title:** WF for [116][229] IoT\_NTN\_TDD

**Document for:** Information

# RRM Core Requirements

**Issue 0-A: Measurement resources**

Agreement (online - Wed):

* RRM measurement requirements should be defined based on NRS rather than NSSS for the detected cells.
* For cell measurement in connected mode (8.14A) and RLM (7.23A), the requirement and corresponding test case should be defined such that the capability of NRS monitoring on DL NB-IoT subframes during ongoing UL transmissions is not mandatory.

**Issue 0-B: DRX**

Tentative Agreement (ad-hoc):

* No RRM requirements in Rel-19 when DRX cycle is equal to or larger than 5.12s

**Issue 1: Cell reselection (4.6A.2)**

Agreement (online - Wed):

* No RRM requirements are defined for scenarios involving WUS.
* No RRM requirements are defined for scenarios involving PUR.
* No RRM requirements are defined for eDRX.
* Define RRC Idle measurement requirements for cell reselection based on Table 4.6A.2.2-1 and Table 4.6A.2.5-1, for intra-frequency and inter-frequency scenarios, respectively.
* Tdetect,NB\_Intra -NC, Tmeasure,NB\_Intra -NC and Tevaluate, NB\_intra -NC for **intra-frequency** based on Table 4.6A.2.2-1

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,NB\_Intra\_NC [s]  (number of DRX cycles) | Tmeasure,NB\_Intra\_NB\_NC [s]  (number of DRX cycles) | Tevaluate,NB\_intra\_NB\_NC [s]  (number of DRX cycles) |
| 0.32 | 5.12 (16) | 1.28 (4) | 2.56 (8) |
| 0.64 | 5.12 (8) | 1.28 | 2.56 (4) |
| 1.28 | 5.12 (4) | 1.28 (1) | 2.56 (2) |
| 2.56 | 10.24 (4) | 2.56 (1) | 5.12 (2) |
| 5.12 | No requirement in Rel-19 | No requirement in Rel-19 | No requirement in Rel-19 |
| 10.24 | No requirement in Rel-19 | No requirement in Rel-19 | No requirement in Rel-19 |

* + Tdetect,NB\_Inter\_NC, Tmeasure,NB\_Inter\_NC and Tevaluate,NB\_Inter\_NC for **inter-frequency** based on Table 4.6A.2.5-1

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle length [s] | Tdetect,NB\_Inter\_ NC [s]  (number of DRX cycles) | Tmeasure,NB\_Inter\_ NC [s]  (number of DRX cycles) | Tevaluate,NB\_Inter\_ NC [s]  (number of DRX cycles) |
| 0.32 | 5.12 (16) | 1.28 (4) | 2.56 (8) |
| 0.64 | 5.12 (8) | 1.28 | 2.56 (4) |
| 1.28 | 5.12 (4) | 1.28 (1) | 2.56 (2) |
| 2.56 | 10.24 (4) | 2.56 (1) | 5.12 (2) |
| 5.12 | No requirement in Rel-19 | No requirement in Rel-19 | No requirement in Rel-19 |
| 10.24 | No requirement in Rel-19 | No requirement in Rel-19 | No requirement in Rel-19 |

**Issue 2: Cell measurement in connected mode (8.14A)**

Agreement (online - Wed):

* For connected mode channel quality report, reuse the existing requirement
* Intra-frequency serving cell measurement requirement
  + When DRX is not in use
    - Reuse the existing requirements
  + When DRX is in use
    - Reuse the existing value of Tmeasure\_intra (s) = 5 DRX cycles
    - No requirement in Rel-19 when DRX cycle is 5.12s and larger.
* Intra-satellite **neighbor cell measurement** requirements
  + When DRX is not in use:
    - Tdetect\_intra\_NB1-NC and Tmeasure \_intra\_NB1-NC are
      * 1.89 sec and 800 ms
  + When DRX is in use:
    - * Tdetect\_intra\_NB1-NC = 10 DRX cycles
      * Tmeasure \_intra\_NB1-NC = 2 DRX cycles
      * No requirement in Rel-19 when DRX cycle is 5.12s and larger.
      * Scale Tdetect\_intra\_NB1-NC and Tmeasure \_intra\_NB1-NC by a factor of 2, when the UE measures cells across 3 or more different patterns of DL opportunities
* Inter-satellite measurements mode and inter-frequency measurement requirement
  + Reuse the existing requirement
  + No requirement in Rel-19 when DRX cycle is 5.12s and larger.

**Issue 3: RRC re-establishment (6.5A)**

Agreement (online - Wed):

* Tsearch\_NB1-NC,i in RRC re-establishment requirement is
  + If the target cell is *known*, then Tsearch\_NB1-NC,i = 0 ms. If the target cell is unknown, Tsearch\_NB1-NC,i = Ksatellite,i \*2.52 sec.
  + FFS the definition of Ksatellite,i

**Issue 4: RRC Connection redirection to Non-Anchor Carrier (6.9A)**

Agreement (ad-hoc):

* Tperiod\_DL\_bitmap: It is hardcoded as zero in RRM spec.

**To be further discussed and concluded in RAN4#116-bis**:

* Change ‘110 ms’ in the following bullets to an integer number of 90ms + DL-to-UL gap within the 90 ms TDD pattern, where the exact value is TBD upon completion of RAN1 spec.
  + TRRC\_procedure\_delay: It is the RRC procedure for processing the received message “CarrierConfigDedicated-NB”. It shall be less than 110 ms.
  + When the NPUSCH ACK transmission for the received RRC message takes longer than 110ms, the overall RRC connection redirection delay may be extended.
* TBD for the values of 10 ms, 40 ms, and 8 ms in the following bullets, and whether to retain the *DL-Bitmap-NB* IE upon completion of RAN1 and RAN2 spec:
  + TDL-UL switch: It is the time between the end of the last subframe in the repetition period of NPDCCH received on the non-anchor carrier and the start of the first subframe in the repetition period of the corresponding NPUSCH transmitted on the non-anchor carrier.
    - Option 1: TDL-UL switch is 8 ms.
    - Option 2: TDL-UL switch is 50 ms (THALES, Iridium)

**Issue 5: RLM (7.23A)**

Agreement (online - Wed):

* Rmax
  + For the RLM requirement definition, the applicable Rmax should be limited to [2]. Additionally, the ‘Maximum NPDCCH Repetition Level’ should be modified from Rmax/4 in the existing NB-NTN requirements to Rmax/2.

Tentative Agreement (ad-hoc):

* Rmax
  + The RLM requirements in terms of RLF evaluation period are applicable only when the configured Rmax is equal to 2.
  + Rmax is configurable by NW.
* OOS and IS evaluation periods
  + When DRX is not in use,
    - 800 ms and 200 ms for OOS and IS, respectively.
  + When DRX is in use,
    - 8 DRX cycles for 0.256 ≤ DRX cycle ≤ 1.024
    - 4 DRX cycles for 1.024 < DRX cycle ≤ 3.072
    - 3 DRX cycle for 4.096 < DRX cycle < 5.12

**Issue 7: LS from RAN1 on precompensation**

**Moderator’s note:**

* It is under discussion over email thread #316