**3GPP TSG-RAN4 Meeting #108-bis *R4-2317289***

Xiamen, China, 9 – 13 October 2023

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **DraftCR** | **rev** | **1** | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Draft CR for introducing intra-frequency neighbour cell measurement requirements for release 18 RedCap UE | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_redcap\_enh-Core | | | | |  | ***Date:*** | | | 2023-10-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | To introduce intra-frequency neighbour cell measurements when configured with eDRX cycle ≥ 20.48 sec. Changes are based on the agreements captured in: R4-2303259, R4-2310154, R4-2314372, R4-2306365. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Change 1 :  Adding requirements for serving cell measurements for RedCap enhancements for INACTIVE mode. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No requirements for neighbour cell measurements when configured with eDRX cycles ≥ 20.48 sec in INACTIVE state. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1B.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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----------------------------**

5.1B.2.3 Measurements of intra-frequency NR cells

The requirements in clause 4.2.2.3 shall apply when UE is not configured with eDRX\_IDLE. When UE is configured with eDRX\_IDLE and UE is not configured with eDRX by [*ran-ExtendedPagingCycle-r18*] or *eDRX-AllowedInactive-r18* is not signalled in SIB1,, the requirements defined in section 4.2.2.3 shall apply with Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap defined in Table 5.1B.2.3-1 and Table 5.1B.2.3-2.

When UE is configured with eDRX by [*ran-ExtendedPagingCycle-r18*] and *eDRX-AllowedInactive-r18* is signalled in SIB1, the requirements defined in section 4.2B.2.5 shall apply with Tdetect, EUTRAN\_RedCap, Tmeasure, EUTRAN \_RedCap and Tevaluate, EUTRAN \_RedCap defined in Table 5.1B.2.3-3 and Table 5.1B.2.3-4.

**Table 5.1B.2.3-1: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap for Redcap UE configured with eDRX\_IDLE cycle, (Frequency range FR1)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX or eDRX INACTIVE cycle length [s]** | **Tdetect,NR\_Intra\_RedCap [s] (number of DRX or eDRX INACTIVE cycles)** | **Tmeasure,NR\_Intra\_RedCap [s] (number of DRX or eDRX INACTIVE cycles)** | **Tevaluate,NR\_Intra\_RedCap [s] (number of DRX or INACTIVE eDRX cycles)** |
|
| 2.56 ≤eDRX\_IDLE cycle length ≤ 10485.76 | 0.32 | 11.52 x M2 (36 x M2) | 1.28 x M2 (4 x M2) | 5.12 x M2 (16 x M2) |
| 0.64 | 17.92 (28) | 1.28 (2) | 5.12 (8) |
| 1.28 | 32 (25) | 1.28 (1) | 6.4 (5) |
| 2.56 | 58.88 (23) | 2.56 (1) | 7.68 (3) |
| 5.12 | 117.76 (23) | 5.12 (1) | 15.36 (3) |
| 10.24 | 235.52 (23) | 10.24 (1) | 30.72 (3) |
| Note1: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. | | | | |

**Table 5.1B.2.3-2: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap for Redcap UE configured with eDRX\_IDLE cycle, (Frequency range FR2)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX or eDRX INACTIVE cycle length [s]** | **Scaling Factor (N1)** | **Tdetect,NR\_Intra\_RedCap [s] (number of DRX or eDRX INACTIVE cycles)** | **Tmeasure,NR\_Intra\_RedCap [s] (number of DRX or eDRX INACTIVE cycles)** | **Tevaluate,NR\_Intra\_RedCap [s] (number of DRX or eDRX INACTIVE cycles)** |
|
| 2.56 ≤eDRX\_IDLE cycle length ≤ 10485.76 | 0.32 | 8 | 11.52 x N1 x M2 (36 x N1 x M2) | 1.28 x N1 x M2 (4 x N1 x M2) | 5.12 x N1 x M2 (16 x N1 x M2) |
| 0.64 | 5 | 17.92x N1 (28 x N1) | 1.28 x N1 (2 x N1) | 5.12 x N1 (8 x N1) |
| 1.28 | 4 | 32 x N1 (25 x N1) | 1.28 x N1 (1 x N1) | 6.4 x N1 (5 x N1) |
| 2.56 | 3 | 58.88 x N1 (23 x N1) | 2.56 x N1 (1 x N1) | 7.68 x N1 (3 x N1) |
| 5.12 | 3 | 117.76 x N1 (23 x N1) | 5.12 x N1 (1 x N1) | 15.36 x N1 (3 x N1) |
| 10.24 | 3 | 235.52 x N1 (23 x N1) | 10.24 x N1 (1 x N1) | 30.72 x N1 (3 x N1) |
| Note1: M2 = 1.5 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. | | | | | |

**Table 5.1B.2.3-3: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap for Redcap UE configured with eDRX\_IDLE cycle and eDRX\_INACTIVE cycle, (Frequency range FR1)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle and eDRX INACTIVE cycle length [s]** | **RANDRX cycle length [s]** | **eDRX INACTIVEPTW length [s] (number of 1.28s periods)** | **Tdetect,NR\_Intra\_RedCap [s] (number of RAN DRX cycles)** | **Tmeasure,NR\_Intra\_RedCap [s] (number of RAN DRX cycles Note 3)** | **Tevaluate,NR\_Intra\_RedCap [s] (number of RAN DRX cycles Note 3)** |
| 20.48 ≤ eDRX\_IDLE cycle length ≤10485.76 | 0.32 | ≥[1.28] ([1]) | (23) | 0.32 x M2 (1 x M2) | 0.64 x M2 (2 x M2) |
| 0.64 | ≥[1.28] ([1]) | 0.64 (1) | 1.28 (2) |
| 1.28 | ≥[2.56] ([2]) | 1.28 (1) | 2.56 (2) |
| 2.56 | ≥[5.12] ([4]) | 2.56 (1) | 5.12 (2) |
| Note 1: RAN DRX cycle in this table is UE specific DRX value configured by RRC specified in [1].  Note 2: The number of RAN DRX cycles in this table is given for the DRX cycles within RAN configured PTWs.  Note 3: eDRX INACTIVE PTW in this table is RAN configured PTW.  Note 4: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].  Note 5: The lower bound of PTW length is derived based on .  Note 6: M2 = 2 if SMTC periodicity of measured intra-frequency cell > 20 ms; otherwise M2=1. | | | | | |

**Table 5.1B.2.3-4: Tdetect,NR\_Intra\_RedCap, Tmeasure,NR\_Intra\_RedCap and Tevaluate,NR\_Intra\_RedCap for Redcap UE configured with eDRX\_IDLE cycle and eDRX\_INACTIVE cycle, (Frequency range FR2)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle and eDRX INACTIVE cycle length [s]** | **RAN DRX length [s]** | **eDRX INACTIVEPTW length [s] (number of 1.28s periods)** | **Scaling Factor (N1)** | **Tdetect,NR\_Intra\_RedCap [s] (number of RAN DRX cycles)** | **Tmeasure,NR\_Intra\_RedCap [s] (number of RAN DRX cycles Note 5)** | **Tevaluate,NR\_Intra\_RedCap [s] (number of RAN DRX cycles Note 5)** |
| 2.56 ≤eDRX\_IDLE cycle length ≤ 10485.76 | 0.32 | ≥5.12 (4) | 8 | (23 x N1) | 0.32 x N1 (1 x N1) | 0.64 x N1 (2 x N1) |
| 0.64 | ≥6.4 (5) | 5 | 0.64 x N1 (1 x N1) | 1.28 x N1 (2 x N1) |
| 1.28 | ≥10.24 (8) | 4 | 1.28 x N1 (1 x N1) | 2.56 x N1 (2 x N1) |
| 2.56 | ≥15.36 (12) | 3 | 2.56 x N1 (1 x N1) | 5.12 x N1 (2 x N1) |
| Note 1: RAN DRX cycle in this table is UE specific DRX value configured by RRC specified in [1].  Note 2: Applies for RedCap UE of all power class.  Note 3: The number of RAN DRX cycles in this table is given for the DRX cycles within RAN configured PTWs.  Note 4: eDRX INACTIVE PTW in this table is RAN configured PTW.  Note 5: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].  Note 6: The lower bound of PTW length is derived based on .  Note 7: When eDRX=20.48s and DRX=0.32s, UE is allowed to perform cell evaluation within PTW in every 2 eDRX cycles. | | | | | | |

When the UE transitions between any two states when changing eDRX\_IDLE cycle length, eDRX\_INACTIVE cycle length, INACTIVE RAN DRX length or changing PTW configuration, the UE shall meet the transition requirement, which is the less stringent requirement of the two requirements corresponding to the first state and the second state, during the transition time interval which is the time corresponding to the transition requirement. After the transition time interval, the UE shall meet the requirement corresponding to the second state.

**----------------------END OF CHANGES 1----------------------------**