**3GPP TSG-RAN WG2 Meeting #117 electronic R2-220**

**Electronic Meeting, Feb 21– Mar 03, 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **36.306** | **CR** | **1844** | **rev** | **-(to be 1)** | **Current version:** | **16.7.0** |  |
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| *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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Introduction of carrier specific NRSRP thresholds for NPRACH resource selection | | | | | | | | | | | |
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| ***Source to WG:*** | CMCC | | | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | | | |
|  |  | | | | | | | | | | | |
| ***Work item code:*** | NB\_IOTenh-Core, TEI16 | | | | | |  | ***Date:*** | | | 2022-03-10 | |
|  |  | | | | |  | |  | | |  | |
| ***Category:*** | **F** | |  | | | | | ***Release:*** | | | Rel-16 | |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | | |
|  |  | | | | | | | | | | | |
| ***Reason for change:*** | | | In real NB-IoT network, single-carrier cells are deployed to meet coverage requirements for most scenarios, and multi-carriers cells are deployed for concurrent service scenarios to meet capacity expansion requirements. The anchor carriers are deployed with inter frequency to reduce interference among cells, and it’s generally that the non-anchor carriers in one cell are deployed on the same frequency as the anchor carrier in the neighbour cells. The downlink narrowband reference-signal EPRE (Energy Per Resource Element) of the non-anchor carriers is generally lower relative to the downlink narrowband reference-signal EPRE of the anchor carrier to reduce the interference between the non-anchor carrier and the neighbour cells using the same frequency. Due to lower EPRE of non-anchor carrier than EPRE of anchor carrier, coverage of non-anchor carrier is shrunken than the anchor carrier. Non-anchor carrier suffered more UL interference from the same frequency neighborhood cell with uplink service terminals. This may degrade uplink performance. According to the actual coverage, there is the overlapping area that the UE’s CE levels is different between on the anchor carrier and non-anchor carriers, and CE level on the non-anchor carriers is usually worse than the CE level for the anchor carrier. The UE may fail to access to the non-anchor carrier or try more times to access to the non-anchor carrier with the nprach resource based on the anchor carrier’s CE level. | | | | | | | | | |
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| ***Summary of change:*** | | | Add an optional capability “carrier specific NRSRP thresholds for NPRACH resource selection” to 6.8.x, to capture that it is optional for UE to carrier specific NRSRP thresholds for NPRACH resource selection as specified in TS 36.321 [4]. This feature is only applicable if the UE supports any ue-Category-NB.  **Impact analysis**  Impacted functionality:  Random Access for multi-carriers  Inter-operability:  If the network implements the change but not the UE, there is no inter-operability issue.  If the UE implements the change but not the network, there is no inter-operability issue.  Implementation of this CR from Rel-14 will not cause interoperability issues. | | | | | | | | | |
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| ***Consequences if not approved:*** | | | In some cases the UE may use more repetitions during random access or even fail random access on a non-anchor carrier with the NPRACH resource based on the anchor carrier’s CE level thresholds. | | | | | | | | | |
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| ***Clauses affected:*** | | | 6.8.x (new) | | | | | | | | | |
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|  | | | **Y** | **N** |  | | | |  | | | |
| ***Other specs*** | | | **X** |  | Other core specifications | | | | TS 36.331 CR 4777  TS 36.321 CR 1535 | | | |
| ***affected:*** | | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | | |
| ***(show related CRs)*** | | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | | |
|  | | |  | | | | | | | | | |
| ***Other comments:*** | | |  | | | | | | | | | |
|  | | |  | | | | | | | | | |
| ***This CR's revision history:*** | | |  | | | | | | | | | |

*Start of Change*

6.8 Other features

6.8.1 System Information Block Type 16

It is optional for UE, including UEs of any *ue- Category-NB*, to support the reception of *SystemInformationBlockType16* as specified in TS 36.331 [5].

6.8.2 QCI1 indication in Radio Link Failure Report

It is optional for the UE to include *drb-EstablishedWithQCI-1* in *RLF-Report* as specified in TS 36.331 [5].

6.8.3 Enhanced random access power control

It is optional for UE to support enhanced random access power control for FDD as specified in TS 36.321 [4] and TS 36.213 [22], clauses 16.2.1.1.1 and 16.3.1. This feature is only applicable if the UE supports any *ue-Category-NB*.

6.8.4 MO-EDT for Control Plane CIoT EPS Optimization

It is optional for UE to support MO-EDT for Control Plane CIoT EPS optimizations as specified in TS 24.301 [28]. This feature is only applicable if the UE supports *ce-ModeA-r13*, or for FDD if the UE supports any *ue-Category-NB*.

6.8.5 Void

6.8.6 Enhanced PHR

It is optional for UE to support enhanced PHR in MSG3 for FDD, as defined in TS 36.321 [4]. This feature is only applicable if the UE supports any *ue-Category-NB*.

6.8.7 void

6.8.8 Resynchronization Signals

It is optional for UE to support resynchronization signals, as defined in TS 36.211 [17]. This feature is only applicable if the UE supports *ce-ModeA-r13*.

6.8.9 Measurement gaps for higher UE velocity

It is optional for UE to support measurement gaps for higher UE velocity, as defined in TS 36.331 [5] and TS 36.133[16]. This feature is only applicable if the UE supports *ce-ModeA-r13*.

6.8.10 MT-EDT for Control Plane CIoT EPS Optimisation

It is optional for UE to support MT-EDT for Control Plane CIoT EPS Optimisation, as defined in TS 24.301 [28]. If the UE supports 'MT-EDT for Control Plane CIoT EPS Optimisation' it shall support 'MO-EDT for Control Plane CIoT EPS Optimisation' as described in clause 6.8.4. This feature is only applicable if the UE supports *ce-ModeA-r13,* or for FDD if the UE supports any *ue-Category-NB*.

6.8.11 MT-EDT for User Plane CIoT EPS Optimisation

It is optional for UE to support MT-EDT for User Plane CIoT EPS Optimisation, as defined in TS 24.301 [28]. If the UE supports 'MT-EDT for User Plane CIoT EPS Optimisation' it shall support *earlyData-UP-r15* as described in clause 4.3.8.7. This feature is only applicable if the UE supports *ce-ModeA-r13,* or for FDD if the UE supports any *ue-Category-NB*.

6.8.12 Segmentation for UE capability information

It is optional for UE to support segmentation of *UECapabilityInformation* as specified in TS 36.331 [5].

6.8.13 Reduced MIB/SIB1-BR acquisition time

It is optional for UE to support reduced MIB/SIB1-BR acquisition time requirements as specified in TS 36.133 [16]. This feature is only applicable if the UE supports *ce-ModeB-r13.*

6.8.14 High speed dedicated network features

It is optional for UE to support HSDN cell reselection handling in RRC\_IDLE and RRC\_INACTIVE (if the UE supports *eutra-5GC-r15*) as specified in TS 36.304 [14] and TS 36.331 [5].

6.8.x Carrier specific NRSRP thresholds for NPRACH resource selection

It is optional for UE to support carrier specific NRSRP thresholds for NPRACH resource selection as specified in TS 36.321 [4]. This feature is only applicable if the UE supports any *ue-Category-NB*.

*End of Change*