**3GPP TSG-RAN4 Meeting #96-e *R4-2012193***

**Electronic Meeting, 17 – 28 August, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **36.133** | **CR** | **6934** | **rev** | **1** | **Current version:** | **16.6.0** |  |
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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 |  | Core Network |  |

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| ***Title:***  | CR on PUR requirements for NB-IoT |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R4 |
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| ***Work item code:*** | NB\_IOTenh3-Core |  | ***Date:*** | 2020-07-11 |
|  |  |  |  |  |
| ***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 canbe 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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | There are some issues with requirements in 4.6.3 related to PUR:* timing alignment validation and NRSRP changed validation are two independent mechanisms, so when only NRSRP-ChangeThresh-NB-r16 is configured, the TA validation should not depend on timing alignment validation
* TA validation with NRSRP1 and NRSRP2 are also defined in clause 5.3.3.19 of 36.331, instead of RAN4 36.133.
* N value is not defined for the case when relaxed serving cell monitoring is not in use.
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| ***Summary of change:*** | Update requirements in 4.6.3 for above issues. |
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| ***Consequences if not approved:*** | Requirements in 4.6.3 are not fully correct. |
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| ***Clauses affected:*** | 4.6.3 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

### <Start of Change 1>

### 4.6.3 Requirements for transmission using preconfigured uplink resources for UE category NB1

#### 4.6.3.1 Introduction

The requirements in this clause are applicable when the UE is configured with timing alignment (TA) validation using *pur-NRSRP-ChangeThreshold-r16* for transmitting in uplink using preconfigured uplink resources (PUR) as specified in [TS 36.331].

#### 4.6.3.2 Requirements on UE synchronization for transmission using PUR

The requirements in this clause are applicable for the UE in normal coverage or in enhanced coverage.

The UE is allowed to transmit using the preconfigured uplink resources provided that the UE is synchronized towards the serving cell prior to transmission. If the UE is not able to obtain the synchronization towards the serving cell then the UE shall drop the PUR transmission. The UE determines the PUR transmission occasion according to the received PUR configuration [TS 36.331].

#### 4.6.3.3 Requirements on TA validation for transmission using PUR

When *NRSRP-ChangeThresh-NB-r16* [TS 36.331] is configured for TA validation based on NRSRP change criterion according to clause 5.3.3.19 in [TS 36.331], with or without TA validation criteria, the UE is allowed to transmit using PUR using the timing derived using the latest available $N\_{TA}$ value as specified in subclause 7.20 provided that

- the first NRSRP (NRSRP1) measurement and the second NRSRP (NRSRP2) measurements used in the TA validation are valid measurements and,

- timing alignment validation for transmission using PUR is valid according to the validation criteria in section 5.3.3.19 in for all configured TA validation criteria [TS 36.331]

NRSRP1 is considered valid provided that the following condition is met when in normal coverage:

*(T1 – min(800 ms, N× DRX cycle)) ≤ T1’ ≤ (T1 + min(800 ms, N×DRX cycle))*

NRSRP1 is considered valid provided that the following condition is met when in enhanced coverage:

*(T1 – min(1600 ms, N× DRX cycle)) ≤ T1’ ≤ (T1 + min(1600 ms, N×DRX cycle))*

NRSRP2 is considered valid provided that the following condition is met when in normal coverage:

*T2 – min(800 ms, N×DRX cycle) ≤ T2’ ≤ T2*

NRSRP2 is considered valid provided that the following condition is met when in enhanced coverage:

*T2 – min(1600 ms, N×DRX cycle) ≤ T2’ ≤ T2*

If at least one of NRSRP1 and NRSRP2 is considered to be invalid based on the above conditions then the UE shall not validate the PUR using NRSRP1 and NRSRP2 and shall not transmit using PUR.

Where

- T1 is the time when the latest $N\_{TA}$was obtained by the UE via Timing Advance Command MAC control element or NPDCCH for transmission on PUR,

- T1’ is the time when the UE has completed NRSRP1,

- T2 is the time when the UE performs TA validation defined in clause 5.3.3.19 of TS 36.331 [2] for transmission using PUR,

- T2’ is the time when the UE has completed NRSRP2.

* N=1 if relaxed serving cell monitoring, as defined in clause 4.6.2.1A for normal coverage or 4.6.2.3A for enhanced coverage, is applied.

- For normal coverage, N is the relaxation factor and is given by Table 4.6.2.1A-1 if the UE is not configured with eDRX\_IDLE cycle and by Table 4.6.2.1A-2 if the UE is configured with eDRX\_IDLE cycle, if relaxed serving cell monitoring as defined in clause 4.6.2.1A is in use, otherwise N=1.

- For enhanced coverage, N is the relaxation factor and is given by Table 4.6.2.3A-1 if the UE is not configured with eDRX\_IDLE cycle and by Table 4.6.2.3A-2 if the UE is configured with eDRX\_IDLE cycle, if relaxed serving cell monitoring as defined in clause 4.6.2.3A is in use, otherwise N=1.

<End of Change 1>