**3GPP TSG-RAN2 Meeting #113-e *draft R2-2102159***

**Online, 25th Jan 2021 - 5th Feb 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **36.331** | **CR** | **4556** | **rev** | **1** | **Current version:** | **16.3.0** |  |
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| *For* [***HELP***](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 |  | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | Correction on paging narrowband selection |
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| ***Source to WG:*** | ZTE Corporation, Sanechips, Ericsson |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | LTE\_eMTC5-Core |  | ***Date:*** | 2021-02-04 |
|  |  |  |  |  |
| ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | Based on the current specification, UE using GWUS selects paging narrowband only among the paging narrowbands that are configured with GWUS. Since RAN2 has agreed that GWUS is not supported for eMTC UEs in RRC\_INACTIVE, a UE in RRC\_INACTIVE selects the paging narrowband as if the UE is not using GWUS, e.g., selects a narrowband among all the paging narrowbands configured in the cell. A UE in RRC\_INACTIVE is required to monitor both RAN paging and CN paging. For CN paging it is expected that the paging happens on the narrowband UE would use in RRC\_IDLE whereas for RAN paging it is expected that the paging happens on the narrowband UE would use in RRC\_INACTIVE. Since RAN and CN paging occasions might overlap, considering that the two types of paging may be sent on different narrowbands, the UE can only receive CN paging or RAN paging (e.g., miss paging on the other narrowband). In other words, unless it is possible for the UE to switch between separate narrowbands quickly for paging monitoring, such missing of paging needs to be avoided. Therefore, in RAN2#112 e-meeting, the following agreement has been achieved:* *UE in RRC\_INACTIVE needs to monitor CN and RAN paging in the same paging narrowband*.

Furthermore, in order to ensure the results of two types of paging narrowband selection schemes used by UE in RRC\_IDLE and in RRC\_INACTIVE (and also the NW) is the same, the following agreement has been achieved in RAN2#113 e-meeting:* *Working assumption: If RRC\_INACTIVE and GWUS are supported then network ensures GWUS is configured on all paging narrowbands*.

That means, a restriction on configuration is needed. |
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| ***Summary of change:*** | In the field description of *groupNarrowBandList*, clarify if RRC\_INACTIVE and GWUS are supported then network ensures GWUS is configured on all paging narrowbands configured in the cell.**Impact Analysis**Impacted functionality:The change impacts paging monitoring for UE in RRC\_INACTIVE.Inter-operability:This CR only impacts network configuration. If the network is not implemented according to the CR, the eMTC UE in RRC\_INACTIVE may miss CN paging or RAN paging. |
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| ***Consequences if not approved:*** | The eMTC UE in RRC\_INACTIVE may miss CN paging or RAN paging if the UE uses GWUS in RRC\_IDLE and GWUS is not configured on all paging narrowbands.  |
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| ***Clauses affected:*** | 6.3.2 |
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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 the change>**

### 6.3.2 Radio resource control information elements

//SKIP THE UNRELATED PART//

#### *– GWUS-Config*

The IE *GWUS-Config* is used to specify the Group WUS configuration. For the UEs supporting GWUS, E-UTRAN uses GWUS to indicate that the UE shall attempt to receive paging in that cell, see TS 36.304 [4].

*GWUS-Config* information element

-- ASN1START

GWUS-Config-r16 ::= SEQUENCE {

 groupAlternation-r16 ENUMERATED {true} OPTIONAL, -- Need OR

 commonSequence-r16 ENUMERATED {g0, g126} OPTIONAL, -- Need OR

 timeParameters-r16 GWUS-TimeParameters-r16 OPTIONAL, -- Cond NoWUSr15

 resourceConfigDRX-r16 GWUS-ResourceConfig-r16,

 resourceConfig-eDRX-Short-r16 GWUS-ResourceConfig-r16 OPTIONAL, -- Need OP

 resourceConfig-eDRX-Long-r16 GWUS-ResourceConfig-r16 OPTIONAL, -- Cond TimeOffset

 probThreshList-r16 GWUS-ProbThreshList-r16 OPTIONAL, -- Cond ProbabilityBased

 groupNarrowBandList-r16 GWUS-GroupNarrowBandList-r16 OPTIONAL -- Need OR

}

GWUS-TimeParameters-r16 ::= SEQUENCE {

 maxDurationFactor-r16 ENUMERATED {one32th, one16th, one8th, one4th},

 numPOs-r16 ENUMERATED {n1, n2, n4, spare1} DEFAULT n1,

 timeOffsetDRX-r16 ENUMERATED {ms40, ms80, ms160, ms240},

 timeOffset-eDRX-Short-r16 ENUMERATED {ms40, ms80, ms160, ms240},

 timeOffset-eDRX-Long-r16 ENUMERATED {ms1000, ms2000} OPTIONAL, -- Need OP

 numDRX-CyclesRelaxed-r16 ENUMERATED {n1, n2, n4, n8} OPTIONAL, -- Need OR

 powerBoost-r16 ENUMERATED {dB0, dB1dot8, dB3, dB4dot8} OPTIONAL, -- Need OR

 ...

}

GWUS-ResourceConfig-r16 ::= SEQUENCE {

 resourceMappingPattern-r16 CHOICE {

 resourceLocationWithWUS ENUMERATED {primary, secondary, primary3FDM},

 resourceLocationWithoutWUS ENUMERATED {n0, n2}

 },

 numGroupsList-r16 GWUS-NumGroupsList-r16 OPTIONAL, -- Need OP

 groupsForServiceList-r16 GWUS-GroupsForServiceList-r16 OPTIONAL -- Cond ProbabilityBased

}

GWUS-GroupsForServiceList-r16 ::= SEQUENCE (SIZE (1..maxGWUS-ProbThresholds-r16)) OF INTEGER (1..maxGWUS-Groups-1-r16)

GWUS-GroupNarrowBandList-r16 ::= SEQUENCE (SIZE (1..maxAvailNarrowBands-r13)) OF BOOLEAN

GWUS-NumGroupsList-r16 ::= SEQUENCE (SIZE (1..maxGWUS-Resources-r16)) OF GWUS-NumGroups-r16

GWUS-ProbThreshList-r16 ::= SEQUENCE (SIZE (1..maxGWUS-ProbThresholds-r16)) OF GWUS-PagingProbThresh-r16

GWUS-NumGroups-r16 ::= ENUMERATED {n1, n2, n4, n8}

GWUS-PagingProbThresh-r16 ::= ENUMERATED {p20, p30, p40, p50, p60, p70, p80, p90}

-- ASN1STOP

| *GWUS-Config* field descriptions |
| --- |
| ***commonSequence***Presence of the field indicates common WUS sequence is configured. Value *g0* indicates common WUS sequence for the shared WUS resource corresponds to *g = 0*, and value *g126* indicates common WUS sequence for the shared WUS resource corresponds to *g = 126*, see TS 36.211 [21]. |
| ***groupAlternation***Presence of the field enables WUS group alternation between the two or more WUS resources for the gap type, see TS 36.304 [4]. |
| ***groupNarrowBandList***List indicating which paging narrowbands support group WUS see TS 36.304 [4]. First entry in the list indicates WUS support for first paging narrowband, second entry in the list indicates WUS support for second paging narrowband, and so on. If E-UTRAN includes *groupNarrowBandList*, the number of entries is equal to the value of *paging-narrowBands*. If this list is absent, group WUS is supported on all paging narrowbands.E-UTRAN does not configure this field when RRC\_INACTIVE is used in the cell. |
| ***groupsForServiceList***Number of WUS groups for each paging probability group see TS 36.304 [4]. The first entry corresponds to the first probability group, the second entry corresponds to the second paging probability group, and so on. Total number of WUS groups in this list cannot be more than the total number of WUS groups in *numGroupsList*. If E-UTRAN includes *groupsForServiceList*, it includes the same number of entries and listed in the same order as in *probThreshList*. |
| ***numGroupsList***List of WUS groups for each WUS resource see TS 36.304 [4]. First entry corresponds to the first resource, second entry corresponds to the second resource, and so on. *numGroupsList* is mandatory present in *resourceConfigDRX*. If *numGroupsList* is not present in *resourceConfig-eDRX-Short*, parameterfor DRX WUS resource applies for short eDRX WUS resource. If *numGroupsList* is not present in *resourceConfig-eDRX-Long*, parameterfor short eDRX WUS resource applies for long eDRX WUS resource. |
| ***probThreshList***Paging probability thresholds corresponding to the paging probability groups, see TS 36.304 [4]. Value *p20* corresponds to 20%, value *p30* corresponds to 30%, and so on. |
| ***resourceConfigDRX, resourceConfig-eDRX-Short, resourceConfig-eDRX-Long***WUS resource configured for each gap type see TS 36.304 [4]. If *resourceConfig-eDRX-Short* is not present, DRX WUS parameters apply for short eDRX WUS resource. If *resourceConfig-eDRX-Long* is not present, short eDRX WUS parameters apply for long eDRX WUS resource. |
| ***resourceMappingPattern***Identifies the WUS resource mapping to time/frequency as defined in TS 36.304 [4]. If *wus-Config-r15* is present in *SystemInformationBlockType2*, the field is set to value *resourceLocationWithWUS*; otherwise the field is set to value *resourceLocationWithoutWUS*. |
| ***timeParameters***Time domain WUS configuration information. For individual field descriptions, see *WUS-Config.* If the field is absent, the parameters in *wus-Config* apply. |

| Conditional presence | Explanation |
| --- | --- |
| *NoWUSr15* | The field is mandatory present if *wus-Config-r15* is not present in *SystemInformationBlockType2*; otherwise the field is not present. |
| *ProbabilityBased* | The field is mandatory present if paging probability based WUS group selection is configured; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TimeOffset* | The field is optionally present, Need OP, if *timeOffset-eDRX-Long* is present in *timeParameters*; otherwise the field is not present, and the UE shall delete any existing value for this field. |

**<End of the change>**