**3GPP TSG-RAN WG2 Meeting #119-eR2-22xxxxx**

**Online, 17 – 29 August, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **31** | **CR** | **4855** | **rev** | **1** | **Current version:** | **17.1.0** |  |
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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:***  | Correction of overheating for NR SCG |
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| ***Source to WG:*** | Qualcomm Incorporated, Ericsson |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | TEI16 |  | ***Date:*** | 08-10 |
|  |  |  |  |  |
| ***Category:*** | **A** |  | ***Release:*** | Rel-17 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | In RAN2#119\_e meeting, during the discussion of the “offline [011][NR1516] RRC LTE Overheating Misc and Idle“ (discussion summary can be found R2-2209071), more specifically on question-3, related to overheating (based on CR “R2-2208207”/“R2-2208207” and CR “R2-2207357”/” R2-2207358”), companies showed different views about the interpretation of the current spec. Some companies assume that the UE will always include the r-14 overheatingAssistance IE whenever UE sends an overheating UAI, irrespective if the LTE MCG is the source of the overheating or not, other companies assume that the r-14 overheatingAssistance IE will be included as necessary, i.e., if UE has/had an overheating preference for the LTE MCG.The discrepancy in companies understanding of the current specification is due to the ambiguity of the normative text that describes the UE expected behavior when UE is experiencing (or no more experiencing) overheating. Current normative text in the spec:2>  else (if the UE no longer experiences an overheating condition):3>  do not include *reducedUE-Category*, *reducedMaxCCs* and *overheatingAssistance-v1610* (if configured to provide overheating assistance indication for NR SCG) in *OverheatingAssistance* IE;The current text does not specify which node (MCG vs SCG or both) was the cause of the overheating condition. In addition, this part of the text gives the impression that “overheatingAssistance-v1610” is a child IE of “OverheatingAssistance” (which is not true). Therefore the entire statement needs to be rectified and have more details added rather than building on top of the current interpretations, which varies from one company to another.  |
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| ***Summary of change:*** | * Clarifying the expected UE behavior when no overheating is experienced by the UE for the MCG and SCG independently to avoid different interpretations.
* Add a note that indicates that it is up to the UE implementation to whether include an empty OverheatingAssistance r-14 IE or not when UE is not experiencing overheating caused by the NR SCG.
	+ This should cause no interoperability issue at the network, as network is either aware that UE had no preference for the IE, so it will ignore the additional info, or simply network will consider this info where no action is expected by the network.

**Impact Analysis:**Impacted 5G architecture options: EN-DCImpacted functionality:SCG overheatingInteroperability issue:* If the Network is implemented according to the CR and the UE is not, no interoperability issue is expected, however network behavior may vary based on what UE had included in the UAI (which varies from one UE vendor to another).
* If the UE is implemented according to the CR and the Network is not, no interoperability issue is expected, as UE will provide more precise UAI for the network to act on.
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| ***Consequences if not approved:*** | There may be misinterpretation of UAI sent by the UE when the UE no longer experiences overheating for NR SCG in EN-DC. |
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| ***Clauses affected:*** | 5.6.10.3 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*Start of Changes*

5.6.10.3 Actions related to transmission of *UEAssistanceInformation* message

The UE shall set the contents of the *UEAssistanceInformation* message for power preference indications:

1> if configured to provide power preference indication and if the UE prefers a configuration primarily optimised for power saving:

2> set *powerPrefIndication* to *lowPowerConsumption*;

1> else if configured to provide power preference indication:

2> set *powerPrefIndication* to *normal*;

The UE shall set the contents of the *UEAssistanceInformation* message for SPS assistance information:

1> if configured to provide SPS assistance information:

2> if there is any traffic for V2X sidelink communication which needs to report SPS assistance information:

3> include *trafficPatternInfoListSL* in the *UEAssistanceInformation* message;

2> if there is any traffic for uplink communication which needs to report SPS assistance information:

3> include *trafficPatternInfoListUL* in the *UEAssistanceInformation* message;

The UE shall set the contents of the *UEAssistanceInformation* message for bandwidth preference indications:

1> set *bw-Preference* to its preferred configuration;

The UE shall set the contents of the *UEAssistanceInformation* message for delay budget report:

1> if configured to provide delay budget report:

2> if the UE prefers an adjustment in the connected mode DRX cycle length:

3> set *delayBudgetReport* to *type1* according to a desired value;

2> else if the UE prefers coverage enhancement configuration change:

3> set *delayBudgetReport* to *type2* according to a desired value;

The UE shall set the contents of the *UEAssistanceInformation* message for the RLM report:

1> if configured to provide RLM report:

2> if T314 has expired:

3> set *rlm-event* to *earlyOutOfSync*;

2> if T315 has expired:

3> set *rlm-event* to *earlyInSync*;

3> if configured to report *rlmReportRep-MPDCCH*:

4> set *excessRep-MPDCCH* to the value indicated by lower layers;

The UE shall set the contents of the *UEAssistanceInformation* message for overheating assistance indication:

1> if configured to provide overheating assistance indication:

2> if the UE experiences internal overheating:

3> if the UE prefers to temporarily reduce its DL category and UL category:

4> include *reducedUE-Category* in the *OverheatingAssistance* IE;

4> set *reducedUE-CategoryDL* to the number to which the UE prefers to temporarily reduce its DL category;

4> set *reducedUE-CategoryUL* to the number to which the UE prefers to temporarily reduce its UL category;

3> if the UE prefers to temporarily reduce the number of maximum secondary component carriers:

4> include *reducedMaxCCs* in the *OverheatingAssistance* IE;

4> set *reducedCCsDL* to the number of maximum SCells the UE prefers to be temporarily configured in downlink;

4> set *reducedCCsUL* to the number of maximum SCells the UE prefers to be temporarily configured in uplink;

3> if configured to provide overheating assistance indication for NR SCG:

4> include *overheatingAssistanceForSCG* in the *OverheatingAssistance* IE;

4> if configured with serving cells operating on FR2-2 for NR SCG

5> include *overheatingAssistanceForSCG-FR2-2* in the *OverheatingAssistance* IE;

4> set *overheatingAssistanceForSCG* and if applicable, *overheatingAssistanceForSCG-FR2-2,* in accordance with clause 5.7.4.3a as specified in TS 38.331 [82];

2> else (if the UE no longer experiences an overheating condition):

3>  if the UE had a preference for the *OverheatingAssistance*:

4> do not include *reducedUE-Category*, *reducedMaxCCs* in *OverheatingAssistance* IE;

3>  if the UE had a preference for the *overheatingAssistanceForSCG*:

4>  do not include *overheatingAssistance-v1610* in the *UEAssistanceInformation-v1610* IE; or

4> do not include *UEAssistanceInformation-v1610* IE in the *UEAssistanceInformation-v1530* IE; or

4> do not include *UEAssistanceInformation-v1530* IEs in *UEAssistanceInformation-v1450* IEs;

4> if configured with serving cells operating on FR2-2 for NR SCG

 5> do not include *OverheatingAssistance-v1710* in the *UEAssistanceInformation-v1710* IE;

NOTE 0: It is up to UE implementation to whether include an empty *OverheatingAssistance* IE or not, for the case where UE only had a preference for the *overheatingAssistanceForSCG*.

The UE shall set the contents of the *UEAssistanceInformation* message for NR SCG deactivation:

1> if configured to provide its preference for NR SCG deactivation;

2> if the UE prefers NR SCG to be deactivated

3> include the *scg-DeactivationPreference* and set it to *scgDeactivationPreferred*:

2> else:

3> include the *scg-DeactivationPreference* and set it to *noPreference*:

The UE shall:

1> if the UE is configured with a deactivated NR SCG and there are uplink data to send on a DRB for which *rlc-Config* is not configured in *drb-ToAddModList*: and

1> if the UE previously did not have any uplink data to send for any SCG RLC entity:

2> include *uplinkData* in the *UEAssistanceInformation* message;

1> if the procedure was triggered to provide SPS assistance information and the related configuration was provided by an *RRCConnectionReconfiguration* message that was received embedded within an NR *RRCReconfiguration* message:

2> submit the *UEAssistanceInformation* message via SRB1 embedded in NR RRC message *ULInformationTransferIRAT* as specified in TS 38.331 [82];

1> else:

2> submit the *UEAssistanceInformation* message to lower layers for transmission.

NOTE 1: It is up to UE implementation when and how to trigger SPS assistance information.

NOTE 2: It is up to UE implementation to set the content of *trafficPatternInfoListSL* and *trafficPatternInfoListUL*.

NOTE 3: Traffic patterns for different Destination Layer 2 IDs are provided in different entries in *trafficPatternInfoListSL.*

NOTE 4: Although not recommended, UE may start or restart the following timers whenever it sends the *UEAssistanceInformation* message (i.e. even if the message was not triggered for the concerned feature): T340, T341, T342, T343, T344 and T345*.*

*End of Changes*