3GPP TSG-RAN WG2 #119 electronic R2-220xxxx

Electronic Meeting, Aug 17th – 29th, 2021

Agenda Item: 5.1.3.1.2

Source: Ericsson

Title: Summary of offline [011][NR1516] RRC LTE Overheating Misc and Idle

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT119-e][011][NR1516] RRC LTE Overheating Misc and Idle (Ericsson)

 Scope: Treat [R2-2208202](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208202.zip), [R2-2208203](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208203.zip), [R2-2207575](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207575.zip), [R2-2207576](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207576.zip), [R2-2207577](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207577.zip), [R2-2208207](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208207.zip), [R2-2208208](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208208.zip), [R2-2207357](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207357.zip), [R2-2207358](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207358.zip), [R2-2208209](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208209.zip), [R2-2208210](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208210.zip), [R2-2208211](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2208211.zip), R2-2208140, [R2-2207540](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207540.zip), [R2-2207558](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207558.zip), [R2-2207559](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_119-e%5CDocs%5CR2-2207559.zip) Determine agreeable parts, For agreeable parts, agree CRs.

 Intended outcome: Report, Agreed CRs, LS out if applicable

 Deadline: Schedule 1

Companies are invited to fill in contact details.

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| --- | --- |
| **Company** | **Contact details** |
| OPPO | shicong@oppo.com |
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| Lenovo | hchoi5@lenovo.com |
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# 2 Discussion

## 2.1 Part 1: Intended to determine agreeable parts

The CRs in [1][2] propose miscellaneous editorial corrections.

**Q1 Do companies agree with the intention of the CRs above?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes | Can merge with the rapp CR. |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes |  |
| MediaTek | Yes |  |
| Lenovo | Yes | Proponent; ok to merge with the rapporteur CR. |
| Nokia | Yes |  |
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The CR in [3] is not provided by the 38331 Rapporteur, and hence not part of this email discussion.

The CRs in [4][5][6] intend to clarify the following:

1. Clarify in 5.5.5.1 (in 36.331) that the UE includes NR serving frequency results if the purpose field in the associated report configuration is not configured or is set to a value other than reportLocation.

2. Clarify in 5.5.5.1 (in 36.331) that the UE includes NR serving frequency results only in case of (NG)EN-DC.

**Q2 Do companies agree with the intention of the CRs above?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes | Proponent |
| Samsung | No | Agree to the intention of this CR, i.e. SN measurement results may be less usefulness to LTE SN for NE-DC, but it seems to be less critical problem. LTE SN could still handle it by implementation i.e. it simply ignores the measurement results. |
| Huawei, HiSilicon | Yes | Proponent |
| MediaTek | Yes |  |
| Nokia | Yes | Proponent, the clarifications are required as the current procedural text seems deficient. |
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The CRs in [7][8][9][10] intend to clarify the UE behavior to indicate overheating mitigation for SCG in case of EN-DC. Two options can be outlined:

Option 1: In [7][8], this is clarified in procedural text.

Option 2: In [9][10], this is clarified with a note.

**Q3 Which option is preferred by companies?**

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| **Company** | **Option 1/2** | **Comments** |
| OPPO | Option 2 | The note clarifies the intended behaviour |
| Samsung | Option 2(if required, possible to merge with Option 1) | Proponent on [9][10].If required, two options could be merged. Then, UEAssistanceInformation-v1530-Ies should be also considered. Actually, we assume it has been implicitly agreed in R2-2111610 (i.e. in the Reasone for change).On the other hand, for Rel-17, the following intention should be also reflected in RRC specification:not including the *overheatingAssistance-v1610* or *overheatingAssistance-v1710* signifies that UE can implement it by not including parent IE, e.g. *UEAssistanceInformation-v1710-IEs*, *UEAssistanceInformation-v1700-IEs*, *UEAssistanceInformation-v1610-IEs* or *UEAssistanceInformation-v1530-IEs*, the NW interpretation in all cases is that “UE did not include *overheatingAssistance-v1610* or *overheatingAssistance-v1710*” |
| Huawei, HiSilicon |  | We understand the issue in [7][8] is the procedural text says “do not include *overheatingAssistance-v1610* in *OverheatingAssistance* IE”, however, the *overheatingAssistance-v1610* is included in *UEAssistanceInformation-v1610* IE. We prefer to simply the change, e.g.3> do not include *reducedUE-Category*, *reducedMaxCCs* in *OverheatingAssistance* IE and do not include *overheatingAssistance-v1610* (if configured to provide overheating assistance indication for NR SCG) in *UEAssistanceInformation-v1610* IE;Besides, the UE cannot send *overheatingAssistance-v1610* if overheating assistance for NR SCG is not configured, so NOTE 0 in [7][8] is not needed. |
| MediaTek | See comment | We support the intention to furhter clarify UE beahvior in this scneario as we understand there is real issue in the field.Option 2 (adding note based on previous agreed CR) could be accetable.For CR in option 1, we have several comments. The coversheet should clarify the intended behavior, it is actually unclear whehter the intetion is to revert previous agreed CR R2-2111610 or not. We don’t wnat to revert previous agreement. For newly added NOTE 0, there is no description on why we need this and the wroding is difficult to understand. We are not sure whehter this is really needed.We would like to continue the wording discussion in phase 2 if agreed to have option 1. HW’s wording on procedure text is one alternative. |
| Verizon | Option 1 preferred | It is important to address the issue as it is a real scenario we see in the field. Option 1 provides better clarity for UE implementation and thus minimizes misunderstanding/interoperability issues between network and UE.NOTE 0 helps when UE is recovering from overheating.Some of the text from Option 2 could be combined into Option 1 in phase 2.  |
| Qualcomm Inc | Option-1  | ProponentIt seems the intention behind Qualcomm CR is missed. it would be great if you can give me the chance to provide more details. Suggested change by Samsung:NOTE 5: not including the *overheatingAssistance-v1610* signifies that UE can implement it by not including parent IE, e.g. *UEAssistanceInformation-v1610-IEs* or *UEAssistanceInformation-v1530-IEs*, the NW interpretation in both cases is that “UE did not include *overheatingAssistance-v1610*”With the current suggested changes by Samsung, not including the *UEAssistanceInformation-vXYZ* can cause backward and forward compatibility issues:* Example of a backward compatibility issue:
	+ By not including the *UEAssistanceInformation-v1450,* the network will not be able to determine if overheating was alleviated for Rel-14 (MN) or for Rel-16 (SN) or for both, as the *UEAssistanceInformation-v1450* contains the overheating information for both MN and SN.

UEAssistanceInformation-v1450-IEs ::= SEQUENCE { overheatingAssistance-r14 OverheatingAssistance-r14 OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1530-IEs OPTIONAL}UEAssistanceInformation-v1530-IEs ::= SEQUENCE { sps-AssistanceInformation-v1530 SEQUENCE { trafficPatternInfoListSL-v1530 TrafficPatternInfoList-v1530 } OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1610-IEs OPTIONAL}UEAssistanceInformation-v1610-IEs ::= SEQUENCE { overheatingAssistance-v1610 OverheatingAssistance-v1610 OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1700-IEs OPTIONAL}\*\*\*\*\*[Samsung] Thank you for further explanation.We also add some comments for further clarification.The backward compatibility issue introduced above seems unclear to us.Actually, *UEAssistanceInformation-v1450* is not related to this topic, i.e. the Reason of change of R2-2111610 mentions *UEAssistanceInformation-v1610-IEs* or *UEAssistanceInformation-v1530-IEs*. In our understanding, delta signalling is not supported in LTE UAI, unlike NR UAI, i.e. when UAI message is initiated due to a type of configured assistance information (see 5.6.10.2), UE shall set contents for all types of the configured assistance information (see 5.6.10.3).\*\*\*\*\** Example of a forward compatibility issue:
	+ By not including the *UEAssistanceInformation-v1610*, we are blocking Rel-17 UEAssistanceInformation*-v17xy* IE from being reported simultaneously in the same UAI report, as Rel-17 UAI are non-critical extensions of the Rel-16 UAI.

UEAssistanceInformation-v1610-IEs ::= SEQUENCE { overheatingAssistance-v1610 OverheatingAssistance-v1610 OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1700-IEs OPTIONAL}UEAssistanceInformation-v1700-IEs ::= SEQUENCE { uplinkData-r17 ENUMERATED { true } OPTIONAL, scg-DeactivationPreference-r17 ENUMERATED { scgDeactivationPreferred, noPreference } OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1710-IEs OPTIONAL}UEAssistanceInformation-v1710-IEs ::= SEQUENCE { overheatingAssistance-v1710 OverheatingAssistance-v1710 OPTIONAL, nonCriticalExtension SEQUENCE {} OPTIONAL}\*\*\*\*\*[Samsung] the coversheet of R2-2111610 doesn’t mention to block other assistance information, i.e. it’s an option for specific case.*not including the overheatingAssistance-v1610 signifies that UE can implement it by not including parent IE, e.g. UEAssistanceInformation-v1610-IEs or UEAssistanceInformation-v1530-IEs, the NW interpretation in both cases is that “UE did not include overheatingAssistance-v1610”*For instance, if not configured to provide SPS assistance information(Rel-15) and UE no longer experiences overheating, UE is not required to include *UEAssistanceInformation-v1530-IEs* and *UEAssistanceInformation-v1610-IEs* according to the coversheet of R2-2111610.On the other hand, if configured to provide SPS assistance information and UE no longer experiences overheating, UE includes *UEAssistanceInformation-v1530-IEs* for *sps-AssistanceIfnromation-v1530*. But, UE is still not required to include *UEAssistanceInformation-v1610-IEs*.UEAssistanceInformation-v1530-IEs ::= SEQUENCE { sps-AssistanceInformation-v1530 SEQUENCE { trafficPatternInfoListSL-v1530 TrafficPatternInfoList-v1530 } OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1610-IEs OPTIONAL}UEAssistanceInformation-v1610-IEs ::= SEQUENCE { overheatingAssistance-v1610 OverheatingAssistance-v1610 OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1700-IEs OPTIONAL}As similar example, if configured to provide its preference for NR SCG deactivation (Rel-17), *UEAssistanceInformation-v1610* has to be signalled, while including *UEAssistanceInformation-v1700* with *scg-DeactivationPreference-r17*. But then, *UEAssistanceInformation-v1610* doesn’t include *overheatingAssistance-v1610*, according to current procedural texts.UEAssistanceInformation-v1610-IEs ::= SEQUENCE { overheatingAssistance-v1610 OverheatingAssistance-v1610 OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1700-IEs OPTIONAL}UEAssistanceInformation-v1700-IEs ::= SEQUENCE { uplinkData-r17 ENUMERATED { true } OPTIONAL, scg-DeactivationPreference-r17 ENUMERATED { scgDeactivationPreferred, noPreference } OPTIONAL, nonCriticalExtension UEAssistanceInformation-v1710-IEs OPTIONAL}UEAssistanceInformation-v1710-IEs ::= SEQUENCE { overheatingAssistance-v1710 OverheatingAssistance-v1710 OPTIONAL, nonCriticalExtension SEQUENCE {} OPTIONAL}\*\*\*\*\***QC CR is addressing these issues, by ensuring all the UEAssistanceInformation IEs are independent**. more specifically the CR is restricting the UE to only “not include” the *overheatingAssistance-v1610* for the NR SCG case, and *overheatingAssistance-v1710* for the case of NR SCG FR2-2. This will remove ambiguity at the network, and at the same time ensure forward compatibility with Rel-17 onward. **QC CR**:2> else (if the UE no longer experiences an overheating condition):3>  if the UE had a preference for the *OverheatingAssistance* IE:4> do not include *reducedUE-Category*, *reducedMaxCCs* in *OverheatingAssistance* IE;3>  if the UE had a preference for the *overheatingAssistanceForSCG* IE:4>  do not include *overheatingAssistance-v1610* in the *UEAssistanceInformation-v1610* IE;4> if configured with serving cells operating on FR2-2 for NR SCG 5> do not include *OverheatingAssistance-v1710* in the *UEAssistanceInformation-v1710* IE; |
| Nokia | Not sure | Its unclear what eventually UE implementation is. UEAssistanceInformation-v1530-Ies is not a parent IE for overheatingAssistance-v1610, which is specifically for SCG. Thus it should be clear what the UE intends to indicate, by not mixing with -v16 with v15. We think this is unclear interpretation for the network. |
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The CRs in [11][12][13] propose to update the description of the overheating IEs, to reflect that the UE sends the overheating UAI for active CCs.

**Q4 Do companies agree with the intention of the CRs above?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes |  |
| Samsung | No | We have a strong concern on this change because it results in a critical impact on current UE implementation. Furthermore, RRC specification clearly mentions 'configured CCs' in5.7.4.3 Actions related to transmission of *UEAssistanceInformation* message*(skipped)*1> if transmission of the *UEAssistanceInformation* message is initiated to provide *maxCC-Preference* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:2> include *maxCC-Preference* in the *UEAssistanceInformation* message;2> if the UE has a preference on the maximum number of secondary component carriers for the cell group:3> include *reducedMaxCCs* in the *MaxCC-Preference* IE;3> set *reducedCCsDL* to the number of maximum SCells the UE desires to have configured in downlinkin the cell group;3> set *reducedCCsUL* to the number of maximum SCells the UE desires to have configured in uplinkin the cell group;Finally, we see no problem with the current specification.[Qualcomm] configured CC could be configured active CC and/or configured inactive CC. In addition the same IE for the power saving feature, it was explicitly mentioned ”active" CC, so clearly there is a misalignment between feature that needs to be rectified.[Samsung]In the procedural texts in 5.7.4.3 (power saving) and 5.7.4.3a (overheating), ‘UE desires to have configured‘ is described.We cannot support this change since we can see no critical problem with the current specification. Rather, this change may just confuse the network, especially in the case of mixing of legacy UEs and new UEs implementing this change. |
| Huawei, HiSilicon | No | These are NBC changes. Based on previous discussion and conclusion, the intention of *reducedCCs* is about “configured CC” instead of “active CC” which can be hinted from the description “Indicates the UE's preference on reduced configuration corresponding... ”.[Qualcomm] in the previous discussion it was agreed to be left to Network implementation how to handle the UAI report, by either deactivating or deconfiguring the designating CC. |
| MediaTek | Prefer No |  |
| Qualcom Inc | Yes | ProponentJust to make a couple of comments:* As mentioned in the CR ”reduced configuration” doesn’t necessarily mean only configured CCs, as configured CCs can be active and/or non-active.
* Reporting configured non-active CCs is useless, as configured CCs are not the source of overheating.
* The CR doesn’t address what would be the network expected behavior upon reception of the UAI report, i.e., deconfiguring or deactivating a specific CC to reduce overheating, as this has been agreed in previous meeting that it’s left to network implementation to handle the report. The CR is just clarifying the significance of the transmitted value in the UAI report.
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The CRs in [14][15][16] intend to clarify that, when the cell is identified to not support IMS emergency calls when camped on Any Cell state, the UE shall deprioritize the pertinent frequency to be the lowest priority frequency.

**Q5 Do companies agree with the intention of the CRs above?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| OPPO | No | Not sure how frequent the case happens in the field. BTW, even if it happens, is it possible that the UE igores the previous cell and reselect to another cell for camping by UE implementation. |
| Samsung | Yes | Once UE reselects an acceptable cell that supports IMS energency calls, it is very likely with the existing cell reselection criteria that UE reverts to the previous cell not supporting IMS emergency calls. This ping-pong of reselection is undesirable. @OPPO, It will not be consistent with present specification. We think a clear behaviour should be provided in the specification to support UE implementation. |
| Huawei, HiSilicon | No | The spec already allowes the UE ignores priorities provided in SI in order to reselect to an acceptable cell that supports emergency calls, this change is not necessary. Besides, some other cells in the same frequency will be impacted according to the CR. |
| MediaTek | No | We prefer leave this to UE implmentation. |
| Qualcomm Inc | May be not | Changing Rel-15 procedural text is too much; a Chair Note may be sufficient, |
| Lenovo | No | Not clear what the issue is with the current behaviour since it was adopted from LTE (where it is specified since Rel-9). Was such ping-pong effect observed in the field? |
| Nokia | No, avoided by proper UE implementation | Problem is possible with stupid implementation i.e. UE will reselect out of IMS not supporting cell/frequency and on new frequency/cell it will perfrom regular reselection which may cause reselection back to this cell/frequency not supporting IMS emergency. Proper UE will handle this and if we want to specify solution it would need much smarter approach i.e. merely UE is allowed to consider IMS not supporting frequency as lower priority for X seconds. It cannot last forever as IMS support may not be whole PLMN wide issue! |
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## 2.2 Part 2: Intended to progress discussion on agreeable parts

- To be updated after discussion on part 1 -

# 3 Conclusion

- To be updated after discussion on part 1 -

# 4 References

1. R2-2208202 Miscellaneous corrections Lenovo draftCR Rel-16 38.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
2. R2-2208203 Miscellaneous corrections Lenovo draftCR Rel-17 38.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
3. R2-2208140 Miscellaneous non-controversial corrections Set XV Ericsson CR Rel-16 38.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
4. R2-2207575 Correction on NR serving frequency results reporting for event-triggered measurement (R15) Huawei, HiSilicon, OPPO, MediaTek Inc., vivo, Nokia, Nokia Shanghai Bell, CATT, Ericsson, NTT DOCOMO, Lenovo, ZTE Corporation, Apple, NEC, China Telecom CR Rel-15 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
5. R2-2207576 Correction on NR serving frequency results reporting for event-triggered measurement (R16) Huawei, HiSilicon, OPPO, MediaTek Inc., vivo, Nokia, Nokia Shanghai Bell, CATT, Ericsson, NTT DOCOMO, Lenovo, ZTE Corporation, Apple, NEC, China Telecom CR Rel-16 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
6. R2-2207577 Correction on NR serving frequency results reporting for event-triggered measurement (R17) Huawei, HiSilicon, OPPO, MediaTek Inc., vivo, Nokia, Nokia Shanghai Bell, CATT, Ericsson, NTT DOCOMO, Lenovo, ZTE Corporation, Apple, NEC, China Telecom CR Rel-17 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
7. R2-2208207 Rel-16 Correction of overheating for NR SCG Qualcomm Incorporated, Ericsson CR Rel-16 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
8. R2-2208208 Rel-17 Correction of overheating for NR SCG Qualcomm Incorporated, Ericsson CR Rel-17 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
9. R2-2207357 SCG Overheating termination in EN-DC Samsung CR Rel-16 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
10. R2-2207358 SCG Overheating termination in EN-DC Samsung CR Rel-17 36.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
11. R2-2208209 Rel-15 Clarification on the overheating UAI Qualcomm Incorporated CR Rel-15 38.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
12. R2-2208210 Rel-16 Clarification on the overheating UAI Qualcomm Incorporated CR Rel-16 38.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
13. R2-2208211 Rel-17 Clarification on the overheating UAI Qualcomm Incorporated CR Rel-17 38.331, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
14. R2-2207540 UE behavior when IMS emergency call is not supported in cell Samsung CR Rel-15 38.304, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
15. R2-2207558 UE behavior when IMS emergency call is not supported in cell Samsung CR Rel-16 38.304, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022
16. R2-2207559 UE behavior when IMS emergency call is not supported in cell Samsung CR Rel-17 38.304, RAN2#119-e, Eletronic Meeting, Aug 17th – 29th, 2022