3GPP TSG-RAN WG2 Meeting #109e [R2-200xxx](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2002087.zip)x

Elbonia, Online, 24 February – 6 March 2020

**Agenda item: 4.5**

**Source: RAN2 Vice-chair (offline email discussion rapporteur)**

**Title: Report of [AT109e][202][LTE15] Discuss remaining LTE Rel-15 CRs (RAN2 VC)**

**Document for: Report**

# 1 Scope of the offline email discussion

This document contains the summary of the offline email discussion “**[AT109e][202][LTE15] Discuss remaining LTE Rel-15 CRs (RAN2 VC)**”, as indicated below:

* [AT109e][202][LTE15] Discuss remaining LTE Rel-15 CRs (RAN2 VC)

Scope:

* + - Discuss the CRs [R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip), [R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip), [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip), [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip), [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) and [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip) over offline (email) discussion to solicit opinions from companies on the proposals and CR correctness.
		- Handle any CRs from discussion **201** that are deemed require further discussion

 Intended outcome:

* + - Whether any of the CRs can be agreed?
		- For CRs that can be agreed, final CRs (by CR proponents)
		- Summary of discussions (by email rapporteur)

 Deadline for providing comments and for rapporteur inputs:

* + - Companies input: Thursday, Feb. 27th 17:00 CET
		- Rapporteur summary: Friday, Feb. 28th 17:00 CET (one day for rapporteur to make conclusions)
		- Updated CRs from each CR proponent: Monday Mar. 2nd 17:00 CET
		- Comments on CR wording: Tuesday, March 3rd by 17:00 CET (i.e. one day to provide comments to the updated CR)

# 2 LTE legacy CRs in this offline email discussion

## 2.1 [R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip), “Inclusion of Maximum Number of PDCP SDUs per TTI for DL Categories 22-26“ Nokia, Nokia Shanghai Bell

The CR in the title is discussed in this section. Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree to the intent of the CR?** | **Detailed comments** |
| Ericsson |  | * Date on the cover page needs to be updated
* Reason for change can be updated as follows: “In Annex A, Table A-1 provides the maximum values for DL PDCP SDUs per TTI for each (DL) UE category. R2-1813149 provides CR1628, which introduces UE categories that support 1024QAM. The CR was approved in however the table was not updated accordingly.

**Impact analysis**Impacted functionality: functionality impacted.Inter-operability: * If the network is implemented according to the CR and the UE is not the UE may use wrong estimates on PDCP SDU size per TTI leading to limiting capabilities on packets’ size handling.

If the UE is implemented according to the CR and the network is not the NW will use wrong estimates on PDCP SDU size per TTI, leading to limiting capabilities on packets’ size handling. |
| Qualcomm | **Ok, see comments.** | Note sure what “impacted functionalty: functionality impacted” mean.Also it would be nice to know how the numbers are calculated. Maybe add something in coverpage? |
| Lenovo | **Yes** | We agree with Qualcomm that it would be good to know how the numbers were calculated. If we recall correctly, in the past the numbers were calculated based on the following assumptions:* For each DL category take the max value as specified in the column “Maximum number of DL-SCH transport block bits received within a TTI”
* PDCP SDU size of 1500bytes
* Due to the fact that PDCP PDU sizes may be smaller than 1500bytes, take a margin of factor 2 and roundup the result to a reasonable integer value

Based on above, we calculated the following values:

|  |  |
| --- | --- |
| DL Category 22 | 428 (Nokia: 430) |
| DL Category 23 | 479 (Nokia: 480) |
| DL Category 24 | 505 (Nokia: 510) |
| DL Category 25 | 553 (Nokia: 560) |
| DL Category 26 | 589 (Nokia: 590) |

As result, the proposed values look ok, but we can add further margin, e.g. for cat26 (to 600). |
| HW | **Yes** | Minor comment on the cover sheet:The impacted functionality should be 1024QAM |
| Nokia, Nokia Shanghai Bell | **Yes** | (as a proponent we agree with the suggestions above) |

**Conclusion on [R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip):** Intent of the CR seems agreeable. Some revisions to cover page to explain the calculations and to the numbers in the CR as per above are needed.

**Proposal 1 ([R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip)):** Agree to revised CR in R2-2001726 with the above changes.

## 2.2 [R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip), [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip) “Correction of UE assistance information Samsung Telecommunications

The CR in the title is discussed in this section. Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree to the intent of the CR?** | **Detailed comments** |
| Ericsson | **Yes, but** | We wonder if we can still fix the timer settings in REL-16 for LTE? It is correct, that RAN2 agreed to allow REL-16 UE to (re-)start the timers for other features, than the one that was triggered. But it would be nice to have similar behaviour as in NR from REL-16 we think. The revision number for REL-15 CR should be 1?Perhaps consider some re-wording of NOTE 4: NOTE 4: The UE is recommended to only start or restart the prohibit timer of the feature that was triggered, but the UE may start or restart timers T340, T341, T342, T343, T344 and T345 when it sends the *UEAssistanceInformation* message. |
| Samsung | **Yes** | We are fine to mandate the recommended behaviour from R16 as suggested by Ericsson.We are also fine to somewhat modify the wording of the node i.e. to start with the recommended behaviour |
| HW | **Yes, but** | We think this has already been discussed in last meeting and we don’t want to duplicate the discussion here, we should follow the agreements achieved in last meeting.* Have a Rel-16 LTE RRC CR to reflect the individual per-function handling of prohibit timers. Allow that UEs may still start/ restart the timers also when UE assistance information is sent for reporting concerning another feature.
 |
| Nokia, Nokia Shanghai Bell | **Not sure** | The CRs are changing legacy behaviour. The Note 4 offers the NW ambiguous instructions in a way that question the CR overall. |
| Samsung |  | Response to HW and Nokia/ NSN:During our previous meeting we had an offline during which it was concluded to introduce this correction from R15 rather than from R16. I reported that when presenting the CR, that accordingly was to R15. However, it seems this did not end up in the minutes, which unfortunately stated that the CR was to R16. I only discovered the issue during actual CR implementation and then agreed with Juha to re-submit the same R15 CR again.I trust we can stick to the conclusion of the previous offline and don’t need to re-open what to do for R15. From my perspective, we only need to conclude whether for R16 to proceed with a straight shadow or to mandate the correct UE behaviour regarding prohibit timer operation (aligning with NR). Given that some concerns are raised to deviate from previous agreements, I suggest to just agree the R15 CR now. |

**Conclusion on [R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip) and [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip):** Intent agreed for Rel-15 in last meeting with (partial) support from 3 companies and some doubts from 3 companies for Rel-16 changes. Suggest agreeing to Rel-15 CR as per last meetings changes and consider Rel-16 CRs separately next time.

**Proposal 2 ([R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip) and [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip)):** Agree to Rel-15 CR (based on R2-2001156) in this meeting (as per earlier decision) and postpone discussion on Rel-16 CRs (i.e. whether they are pure shadows or contain additional content on prohibit timers) to next meeting. The revised Rel-15 CR can be provided in R2-2001729.

## 2.3 [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip), “Correction on the content of RRCConnectionReconfigurationComplete message“ Google

The CR in the title is discussed in this section. Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree to the intent of the CR?** | **Detailed comments** |
| Ericsson | **Yes** | The handling seems to be aligned with the handling we have for the *RRCSetupComplete* message. When the UE constructs the *RRSetupComplete* message it only includes e.g. the RLF report if the UE is connecting to EPC (see section 5.3.3.4 in 36.331). |
| Qualcomm | **Partly** | We understand R15 eLTE does not support SON/MDT reporting. However, not sure why a UE connected to 5GC cannot include flightPathInfoAvailable.Also, this is LTE RRC CR, is correct to say Impacted 5G architecture options: StandaloneOther specs affected should be filled. |
| Google | **Yes** | Regarding to Qualcomm’s comments:For the *flightPathInfoAvailable*, this is also aligned with the handling we have for the *RRCSetupComplete* message.Since this is LTE RRC CR, it is correct that we should not say impatced 5G architecture “standalone”. We will delete the Impacted 5G architecture options.Regarding to the “Other spec affected”, we have not idea which other specs will be affected. It will be helpful if Qualcomm can provide the reference. |
| Samsung | **Not sure** | We are not sure if there really is a problem. I.e. would an R15 UE connected to 5GC really collect the concerned SON/ MDT information? If not, the UE will anyhow not trigger sending any of these availability indications |
| HW | Yes | A typo in the cover sheetBoth reason for change and summary of change should be updated A UE connected to 5GC should not include the rlf-InfoAvailable, logMeasAvailableMBSFN, logMeasAvailable, logMeasAvailableBT, logMeasAvailableWLAN, connEstFailInfoAvailable, flightPathInfoAvailable in the RRCConnectionReconfiguration -> should add Complete message.Other specs affected should marked with “N” |
| Nokia. Nokia Shanghai Bell | **Not sure** | We confirm the understanding that R15 eLTE does not support SON/MDT reporting, but Rel-16 SON/MDT WI just agreed that LTE RLF can be reported in NR. In the upcoming Rel-16 version this change will be obsoleted |

**Conclusion on [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip):** Some support (from 4 companies) but also some doubts (from 3 companies) on necessity. Doesn’t seem critical as most likely UE would never be configured with such reporting in 5GC. It’s also expected that the functionalities will be added to 5GC in later releases, which would require changes to RRC again and potentially lead to differences between different release UEs. Therefore, it is proposed to note the CR (can be re-discussed if real problems can be identified).

**Proposal 3 ([R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip)):** The CR [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip) is noted. TBA

## 2.4 [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip), “The problem of LTE RLC out-of-order delivery configuration“ Samsung AND [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip), “CR on RLC OutOfOrderDelivery configuration“ Samsung

The CR in the title is discussed in this section. Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree to the intent of the discussion document and the CR?** | **Detailed comments** |
| LG | **Yes, but** | In our understanding, the out-of-order delivery function can be used if the t-Reordering is configured to the PDCP entity. Thus, we propose as following text.Indicates that out-of-order delivery from RLC to PDCP is configured for this RLC entity as specified in TS 36.322 [7]. E-UTRAN sets this field to TRUE only when the associated PDCP entity is configured with *t-Reordering*. |
| Ericsson | **No** | RLC reordering without duplication was discussed, agreed and implemented as part of the HRLLC WI and it shouldn’t be removed now. The network will ensure that the configuration of reordering in different layers wotk together.  |
| Qualcomm | **No** | The specs are ok as they are now. There is no “problem” as such. No correction is necessary. |
| Samsung |  | We are fine with LG’s suggestion since no problem would be foreseen if t-reordering is configured.Regarding Ericsson’s comment, the problem would be still there even if the current specification was implemented regardless of PDCP duplication. We are not trying to remove something we already agreed. Note that the current RRC specification allows RLC out-of-order delivery for all the cases.We don’t think that UE implementaion should consider RLC out-of-order delivery for normal DRBs associated with the PDCP entity not configured with t-reordering, which can cause error cases. If the network ensures that the configuration of reordering in different layers wotks together, it should be clarified in RRC specification to make UE implementation clear.Regarding QC’s comment, Note that NR PDCP uses t-reordering always for all types of radio bearer since RLC out-of-order delivery is mandatory. However, LTE PDCP does not use t-reordering for normal DRBs but RLC out-of-order delivery is configurable for normal DRBs, which causes error cases, .e.g. data loss and PDCP out-of-order delivery problem. We agree that RLC out-of-orderd delivery can be independent of PDCP duplication. However, it cannot be independent of t-reordering since it can cause error cases.Even if we trust eNB, the RRC specification is now allowing error cases. That's why we would like to do clarification. We are not trying to restrict network implementation. By LG's suggestion, the clarification makes the network implementation and UE implemenation do the right thing. |
| Apple | **No** | ***rlc-OutOfOrderDelivery*** can also be configured for EN-DC split bearer, and it should not be limited in the PDCP duplication case. In NR, t-reordering is also possible to be set to infinity. Therefore, correct NW implementation is expected.  |
| Samsung |  | Regarding Apple’s comment, Note that EN-DC split bearer always uses NR PDCP with t-reordering. Hence, there is no issue for that. We are talking about LTE PDCP. For LTE split bearer case, the PDCP always uses t-reordering and thus there is no issue as well. In NR, if t-reordering is set to infinity, there would be no data loss and no PDCP out-of-order problem and this case is in general for SRB.  |
| HW | **Yes** | We agree some clarification in RRC is needed as we can not leave everything to the NW implementation and we are fine with the current updated wording.  |
| Nokia, Nokia Shanghai Bell | **No** | We share the view that this capability shouldn’t be limited to the PDCP duplication only. The CR is changing capability in a non-backward compatible manner. |
| Samsung |  | Regarding Nokia’s comment, the proposed CR is updated as follows:…Indicates that out-of-order delivery from RLC to PDCP is configured for this RLC entity as specified in TS 36.322 [7]. E-UTRAN sets this field to TRUE only when the associated PDCP entity is configured with *t-Reordering*.Now, it’s not changing capability. If UE reports the capability of RLC out-of-order delivery, then the smart network should configure RLC out-of-order delivery for DRBs configured with t-reordering not to cause error cases, which would be the intended behaviour. The proposed change is just for clarification to not allow error cases in RRC specification.  |

**Conclusion on [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) and [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip):** There is some support (3 companies agree or partly agree to the CR) but also views that this would change legacy behaviour (from 4 companies). There are also capabilities for both RLC UM and RLC AM out-of-order delivery in 36.306, both of which are optional and do not mention PDCP duplication. A clarification on how t-Reordering and RLC out-of-order delivery could be considered but is proposed to be postponed to next meeting.

**Proposal 4 ([R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) and [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip)):** [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) is noted since views are divided on existing capabilities and we should avoid NBC changes. A clarification may be considered for t-Reordering and RLC Out-of-order delivery relation in the next meeting.

# 3 Conclusions

**Conclusions:**

**Conclusion on [R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip):** Intent of the CR seems agreeable. Some revisions to cover page to explain the calculations and to the numbers in the CR as per above are needed.

**Conclusion on [R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip) and [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip):** Intent agreed for Rel-15 in last meeting with (partial) support from 3 companies and some doubts from 3 companies for Rel-16 changes. Suggest agreeing to Rel-15 CR as per last meetings changes and consider Rel-16 CRs separately next time.

**Conclusion on [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip):** Some support (from 4 companies) but also some doubts (from 3 companies) on necessity. Doesn’t seem critical as most likely UE would never be configured with such reporting in 5GC. It’s also expected that the functionalities will be added to 5GC in later releases, which would require changes to RRC again and potentially lead to differences between different release UEs. Therefore, it is proposed to note the CR (can be re-discussed if real problems can be identified).

**Conclusion on [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) and [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip):** There is some support (3 companies agree or partly agree to the CR) but also views that this would change legacy behaviour (from 4 companies). There are also capabilities for both RLC UM and RLC AM out-of-order delivery in 36.306, both of which are optional and do not mention PDCP duplication. A clarification on how t-Reordering and RLC out-of-order delivery could be considered but is proposed to be postponed to next meeting.

**Proposals on CRs:**

**Proposal 1 ([R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip)):** Agree to revised CR in R2-2001726 with the above changes.

**Proposal 2 ([R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip) and [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip)):** Agree to Rel-15 CR (based on R2-2001156) in this meeting (as per earlier decision) and postpone discussion on Rel-16 CRs (i.e. whether they are pure shadows or contain additional content on prohibit timers) to next meeting. The revised Rel-15 CR can be provided in R2-2001729.

**Proposal 3 ([R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip)):** The CR [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip) is noted. TBA

**Proposal 4 ([R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) and [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip)):** [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip) is noted since views are divided on existing capabilities and we should avoid NBC changes. A clarification may be considered for t-Reordering and RLC Out-of-order delivery relation in the next meeting.

# 4 List of referenced documents

 [1] [R2-2001139](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001139.zip), “Inclusion of Maximum Number of PDCP SDUs per TTI for DL Categories 22-26“ Nokia, Nokia Shanghai Bell CR Rel-15 36.306 15.7.0 1736 - F LTE\_1024QAM\_DL-Core, TEI15

[2] [R2-2001156](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001156.zip), “Correction of UE assistance information Samsung Telecommunications“ CR Rel-15 36.331 15.8.0 4210 - F TEI15, NR\_newRAT-Core

[3] [R2-2001157](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001157.zip), “Correction of UE assistance information“ Samsung Telecommunications CR Rel-16 36.331 15.8.0 4164 2 A TEI15, NR\_newRAT-Core R2-1916490

[4] [R2-2001508](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001508.zip), “Correction on the content of RRCConnectionReconfigurationComplete message “ Google Inc. CR Rel-15 36.331 15.8.0 4224 - F LTE\_5GCN\_connect-Core

[5] [R2-2001347](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001347.zip), “The problem of LTE RLC out-of-order delivery configuration“ Samsung discussion LTE\_HRLLC

[6] [R2-2001351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001351.zip), “CR on RLC OutOfOrderDelivery configuration“ Samsung CR Rel-15 36.331 15.8.0 4217 - F LTE\_HRLLC