3GPP TSG-RAN WG2 Meeting #113 Electronic R2-210xxxx

Elbonia, 25 January – 05 February 2021

**Agenda item: 6.6.3**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary of [AT113-e][612][POS] LPP proposals (Nokia)**

**WID/SID: NR\_pos-Core - Release 16**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT113-e][612][POS] LPP proposals (Nokia)

Scope: Discuss P1-P7 of R2-2101889 and determine which CRs are agreeable.

Intended outcome: Summary in R2-2102105

Deadline: Thursday 2021-02-04 0200 UTC

In this email discussion the following contributions are discussed to decide if these contributions or proposals in the contributions can be agreed. Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of these contributions and for Rapporteur’s comments/suggestions. Please also check the contribution themselves before answering the questions in this email discussion.

[R2-2100405](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100405.zip) Correction on NR-Multi-RTT-RequestAssistanceData, CATT

[R2-2100406](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100406.zip) Corrections on the field description of commonIEsProvideAssistanceData in TS37.355, CATT

[R2-2101382](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101382.zip) Correction of A-GNSS Periodical retrieval of Assistance Data, Ericsson

[R2-2101384](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101384.zip) LPP Layer interaction with lower layers for Positioning Frequency layer and Measurement Gap, Ericsson

[R2-2101827](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101827.zip) Correction to the need code for downlink LPP message, Huawei, HiSilicon

[R2-2101828](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101828.zip) Discussions on PRS configurations, Huawei, HiSilicon

[R2-2101858](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101858.zip) Discussion on the need for fields in the uplink LPP message, Huawei, HiSilicon

# 2 Discussion

## 2.1 nr-AdType field in NR-Multi-RTT-RequestAssistanceData IE

In [R2-2100405](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100405.zip) the following changes are proposed (Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of the issues):

1. Delete ul-srs from the IE nr-AdType within the NR-Multi-RTT-RequestAssistanceData message
2. Add a field description for the IE *nr-AdType* in the *NR-Multi-RTT-RequestAssistanceData*

**Question 1**: Do you agree with the changes proposed in [R2-2100405](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100405.zip)?

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| Answers to Question 1 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel | No | Agree Rapporteur’s analysis in R2-2101889.  1 NBC change;  2 Agree ul-SRS is not transferred via LPP. But It can be used by the UE to trigger the LMF to send the request to serving gNB, just in case. So nothing wrong? |
| Huawei, HiSilicon | No | Should be corrected in the NBC way. Either it is dummified or clarified in the field description that it is not used in this release. |
| vivo | No | Should be corrected in the NBC way |
| Nokia | Maybe | Deleting codepoint or making the bit a dummy value will be a non-backward compatible change. Describing in the field description that this bit is not set by the UE is fine, but I expect no UE will ever use this value. So, not sure if any change is essential. We will go with majority UE vendors preference on this. |
| Qualcomm | No | My understanding is that this bit can be used in case the UE receives a multi-RTT location request, but has no UL-PRS configured or activated. It does not mean that the UL-PRS configuration or activation is provided by an LMF, but an LMF would still have to instigate the procedures for providing an UL-PRS to the UE.  The CR seems to propose that the above case would have to be failure case, and UE sends a *NR-Multi-RTT-Error* instead.  In any case, the CR is not backwards compatible and would require a proper Reason For Change. I.e., the provided reason "the required assistance data from LMF does not include the UL-SRS related information" is obvious, but what is wrong with the current specification? |
| Samsung | No | We concern on making NBC change. So need to be handled in NBC way like dummifying or updating field description as not be used. |
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**Summary 1**: There is no clear majority to agree to the CR as is, but some companies’ comment indicate the change may be OK if it is done in a backward compatible way. One company thinks the ul-srs codepoint can still be used by the UE upon reception of location request for multi-RTT positioning, to communicate to the LMF that it needs UL-SRS configured, if for some reason the UL-SRS is not configured. However, another company disagrees with this interpretation.

**Proposal 1**: CR in R2-2100405 is not agreed, especially given that there is a difference in view about the usage of ul-srs codepoint. Proponent may discuss offline with other companies to see if there is interest to come back to this issue in the next meeting.

## 2.2 commonIEsProvideAssistanceData IE

In [R2-2100406](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100406.zip) the following changes are proposed (Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of the issues):

1. Delete the field descriptions of *commonIEsProvideAssistanceData* in the *ProvideAssistanceData* message.

**Rapporteur’s comments**: The Rapporteur’s comments in the summary in [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) suggested that a field description be added instead of deleting the existing field description. After further investigations, Rapporteur noticed that the *commonIEsProvideAssistanceData* IE in Section 6.4.2 has a description for this IE. So, deleting the field description as suggested in the CR is also an option.

**Question 2**: Do you agree with the changes proposed in [R2-2100406](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100406.zip)? If the answer is No, please suggest a text proposal for the field description of *commonIEsProvideAssistanceData* and any preferences as to which releases should we introduce the changes in.

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| Answers to Question 2 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel | Yes |  |
| Lenovo | Yes | Deleting the misleading field description from R16 is ok as the change is not that critical. However, as the change applies to R14/15 we suggest to adopt the approach of early implementation which is well-known from 38.331 and 36.331 specs. That means a magic sentence is added on the cover page and in 37.355 a new normative Annex is introduced which shall be used to add a list of CRs containing early implementable features and corrections. |
| Huawei, HiSilicon | Yes | Agree with the removal and it should start with R14 all the way to R16 |
| ZTE | Yes |  |
| vivo | Yes |  |
| Nokia | Yes | OK to also add a magic sentence to the CR cover but not sure about a new procedure to document early implementable corrections to a normative annex. |
| Qualcomm | Yes | But wrong Agenda Item and wrong WI code. The LPP Message Segmentation was added as TEI14. Consequences if Not Approved seems to address the Rel-15 field only. Cover Sheet should be corrected.  Agree that a Rel-16 CR with "magic sentence" is sufficient. |
| Samsung | Yes |  |
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**Summary 2**: There is clear majority to agree to the changes in the CR as is (but updates are necessary to the cover sheet). Many companies are open to fixing it in earlier releases also but whether this is done by use of magic sentence in CR cover sheet or through actual CRs needs further discussion. One company suggests a new procedure to document early implementable corrections in a normative annex in 37.355. Rapporteur suggestion is to use the magic sentence in the CR cover sheet for a Rel-16 CR but not consider the creation of the normative annex proposed for 37.355.

**Proposal 2**: CR in R2-2100406 is agreed for Rel-16 with updates to CR cover sheet. CR cover updates should add the magic sentence to make the change applicable for earlier releases and must fix the work item code.

## 2.3 LPP and RRC interaction for NR DL PRS measurements

In [R2-2101384](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101384.zip) the following changes are proposed (Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of the issues):

1. The LPP interaction with RRC and lower layers have been captured 6.4.3.

**Question 3**: Do you agree with the changes proposed in [R2-2101384](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101384.zip)?

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| Answers to Question 3 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel | No | The intention is ok. But changes (start performing Location measurement Indication procedure )are not correct. The LPP has no idea whether RRC measurement gap can work or not. The LPP can only indicate RRC the need of RSTD measurement and corresponding PRS configurations.  So we should use OTDOA similar changes. |
| Huawei, HiSilicon | No | Not essential and capture the inter-layer options internal to the UE. |
| vivo | No | Not essential. |
| Nokia | Maybe | We understand the motivation for the change, but the current text proposed is not clear to us. Open to discussing a better text proposal. Maybe copy the text from LTE specification and modify it for NR. |
| Qualcomm | No | Agree with others that the sentence would need to be improved. E.g., "The LPP layer may inform lower layers to start performing DL-PRS measurements…" or similar.  However, I also tend to agree that this is not an essential correction. In particular, the "Consequences if not approved" seems not correct. There is no functionality missing or added by this CR (if so, it would be Cat B/C CR). |
| Samsung | No | We also understand the intention. But the description in LTE corresponding part would be better without any recognition of RRC procedure. |
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**Summary 3**: There is no clear majority to agree to the CR as is but, some companies’ comments indicate they may be open to a better or clarified text proposal.

**Proposal 3**: CR in R2-2101384 is not agreed as is. Proponent may discuss offline with other companies to see if there is interest to agree on a modified text proposal.

## 2.4 Missing need codes

In [R2-2101827](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101827.zip) the following changes are proposed (Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of the issues):

1. Add the need code for the fields *nr-DL-PRS-ResourceID-List*, *associated-DL-PRS-ID*, *dl-PRS-BeamInfoSet* under *TRP-LocationInformation* and *BeamInfo*, *dl-PRS-QCL-Info*

**Question 4**: Do you agree with the changes proposed in [R2-2101827](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101827.zip)? Are you aware of any other fields that is missing the need code? If so, please list those as part of your comments.

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| Answers to Question 4 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel | Yes | Ok with the corrections. But in the coversheet, affected clause is missing. |
| Lenovo | Partly | * IE NR-DL-PRS-BeamInfo: in the description of associated-DL-PRS-ID-r16 the target behaviour on absence of this field is clarified. Therefore, the Need code should be “Need OP” and not “Need ON”. * Other places where Need codes for optional fields are missing include e.g. IE GridElement-r16, IE NR-DL-AoD-ReportConfig-r16. Furthermore, we spotted missing need codes for optional fields in legacy IEs as well, e.g.   + AssistanceDataSIBelement-r15   + GNSS-ReferenceStationID-r15 (parent IE is used for both UL/DL)   + GNSS-SignalID (parent IE is used for both UL/DL) * In general, we think that the missing need codes for optional R16 fields should be fixed. For R15 and earlier this should be checked carefully in order not to create issues with existing implementations in the field. |
| Huawei, Hisilicon  (Proponent) | Yes |  |
| ZTE | Yes |  |
| vivo | Yes |  |
| Nokia | Yes | We did not have enough time to investigate the other fields mentioned by Lenovo. These could be considered in the next meeting? |
| Qualcomm | Yes, but | The cover sheet needs to be completed (Clauses affected, Rev "-").  The CR also seems not be based on the latest version of the specification. E.g., all the ASN.1 formatting/alignment has been corrected in the latest version (but seems wrong in this CR). Also, the new Need Codes should be properly aligned in ASN.1 (as far as possible). |
| Samsung | Yes |  |
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**Summary 4**: There is clear majority to agree to the CR as is, but the CR needs updates to the cover sheet. One company thinks the need code for *associated-DL-PRS-ID-r16* should be Need OP and not Need ON and thinks that there are other IEs that may need similar corrections in the CR. Rapporteur suggestion is to consider the other IEs that needs similar corrections in the next meeting.

**Proposal 4**: The changes in CR in R2-2101827 is agreed but it should be implemented using the latest baseline specification and updates to CR cover sheet are required. CR cover updates must fix the affected clauses, CR revision, work item code.

## 2.5 Corrections to DL PRS configuration related IEs/fields

In [R2-2101828](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101828.zip) the following changes are proposed:

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| **Proposal 1: Accept the changes regarding DL-PRS related IEs.**   * **Clarify that the numbering space for *NR-DL-PRS-ResourceSetID* is per TRP across multiple frequency layers** * **Modify the sentence "*qcl-DL-PRS-ResourceSetID* specifies the DL-PRS Resource Set ID" to "*qcl-DL-PRS-ResourceSetID* specifies DL-PRS Resource Set configured for the same TRP whose DL-PRS resource serve as the source reference signal for the DL-PRS"** * **Change the name *nrMaxSetsPerTRP* to *nr-MaxSetsPerTRP-PerFrequencyLayer*** * **In the sentence "The IE *NR-SelectedDL-PRS-IndexList* is used by the location server to provide the selected Frequency Layer index of *nr-DL-PRS-AssistanceDataList* to the target device.", it should be the index of PRS resources**   **Proposal 2: Accept the following changes regarding the *associated-DL-PRS-ID*.**   * **In the IE *NR-DL-PRS-BeamInfo***   + **In the field description of *associatedDL-PRS-ID*, remove the sentence "The beam information from the associated TRP is considered to be in GCS if the lcs-gcs-translation-parameter field is not provided, and to be in LCS if the lcs-gcs-translation-parameter field is provided."**   + **In the field description of *associatedDL-PRS-ID*, clarify that when the field is present, the fields *lcs-GCS-TranslationParameter* and *dl-PRS-BeamInfoSet* shall be absent.**   + **In the field desctiption for lcs-GCS-TranslationParameter, clarify that the field’s fucntion for the current TRP is applicable when the field associatedDL-PRS-ID is absent** * **In the IE *NR-TRP-LocationInfo***   + **In the field description of *associatedDL-PRS-ID*, clarify that when the field is present, the field *trp-Location* shall be absent.** |

**Question 5**: Do you agree with the changes proposed in [R2-2101828](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101828.zip)? Please refer to the specific proposal number and relevant field/IE being addressed in the proposal when entering your comments or if agreeing to the changes proposed for a subset of the field/IE mentioned in the proposals.

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| Answers to Question 5 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel | Partially | P1  1 there is definition on this as "The IE NR-DL-PRS-ResourceSetID defines the identity of a DL-PRS Resource Set of a TRP.", we could clarify this is across mulitple freqncy layers.  2 We do not need to change the name of "nrMaxSetSPerTrp", we just need to clarify this is per frequency under the definition part.  nrMaxSetsPerTrp-r16 INTEGER ::= 2 -- Maximum resource sets for one TRP  3 ok  4 ok  P2 not sure. |
| Huawei, HiSIlicon  (Proponent) | Yes |  |
| Nokia | No | A proper CR with good “reason for change” and “consequence if not approved” would help better understand the seriousness of the issue. The proposal P2 is not at all clear as to what reasons the changes are proposed. I don’t see what is essential about the changes proposed in P1 also. |
| Qualcomm | No | It is difficult to comment on the proposals. Would need a CR with proper Reason For Change and Consequences if Not Approved. From the TP in the Annex of this contribution, most of the changes do not look essential to me. A correction for P1, bullet 4 seems required. |
| Samsung | Yes |  |
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**Summary 5**: There is no clear majority to agree to all the proposals in the discussion paper as is. Some companies agree partially to some proposals. Only a text proposal was provided in a discussion paper, but Rel-16 corrections require a CR with proper reason for change and consequences if not approved fields filled in.

**Proposal 5**: Proposals in R2-2101828 are not agreed. Proponent may discuss offline with other companies to see if there is interest to come back to this issue in the next meeting with a CR.

## 2.6 Need code and conditional presence tag in fields in UL messages

In [R2-2101858](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101858.zip) the following changes are proposed (Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of the issues):

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| **Proposal 1: Add the sentence in the R16 spec that “For the fields that are included in both uplink and downlink message, the need code is omitted if it is included in the message in the uplink, while the field remains optional.”**  **Proposal 2: RAN2 should discuss whether the same sentence should be added for the legacy LTE spec from R9 to R14 and legacy NR spec R15.**  **Proposal 3: Adopt the text proposal in section 4.2 for the conditional presence tag in the uplink message introduced in R16.**  **Proposal 4: RAN2 should decide whether the same corrections should be made to the legacy fields introduced in LTE for LPP spec.** |

**Question 6**: Do you agree with the proposals in [R2-2101858](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101858.zip)?

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| Answers to Question 6 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel |  | For UL message:  1 if need code is used for IEs in UL message, network should omit it. I assume it is normal behavior in network, and do not need to change, especially considering this was from R9.  2 Change condition to field descriptions, seems ok. But does not need to update legacy spec. |
| Lenovo | Partly | * To P1: There is no need for it as it is explicitly clarified that “These tags are used in the downlink (server to target) direction only.” * To P2: There is no need for it, see comment to P1 above. * To P3: In principle it is ok to replace the concerned condition by a corresponding field description. The level of details of the field descriptions needs further discussion. * To P4: It is not clear which legacy fields are affected. |
| Huawei, HiSilicon  (Proponent) | Yes |  |
| ZTE |  | P1,P2: we share the same view with Lenovo. Considering the explanation has already existed in the TS, we do not prefer to add extra description.  P3:ok |
| vivo |  | Agree with Lenovo and ZTE. |
| Nokia | No | Agree with the comments from Intel and Lenovo but for the changes that they are open to, we are still not sure how critical these are to change at this stage. |
| Qualcomm | No | Similar to Q5; would need a CR with proper Reason For Change and Consequences if Not Approved.  P1: Not needed. Discussed at Rel-9 and the sentence in 6.1 "These tags are used in the downlink (server to target) direction only." should be sufficient. At least, it has never created any e.g., IOT issues so far. The need codes can anyhow not be "omitted", since ASN.1 comments. |
| Samsung | Partially | We agree on P3 only. For others, we agree with other companies. |
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**Summary 6**: There is no clear majority to agree to all the proposals in the discussion paper as is. Only a text proposal was provided in a discussion paper, but Rel-16 corrections require a CR with proper reason for change and consequences if not approved fields filled in. Some companies’ comment indicate they are partially OK with some proposals (P3 about condition tags for UL messages to be removed and proper field description added to reflect the conditional presence of the field).

**Proposal 6**: Proposals in R2-2101858 are not agreed. Proponent may discuss offline with other companies to see if there is interest to come back to this issue in the next meeting with a CR.

## 2.7 Signalling tracking area code for periodical assistance data transfer/delivery

In [R2-2101382](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101382.zip) the following changes are proposed (Please see [R2-2101889](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101889.zip) for a summary of the issues):

1. Tracking Area Code have been added and capabilty have been added for peridoical assistance data procedure

**Question 7**: Do you agree with the changes proposed in [R2-2101382](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101382.zip)?

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| Answers to Question 7 | | |
| Company | Yes/No | Technical Arguments/Suggested Text Changes/CR cover issues |
| Intel | ? | For the change, there should not be additional efforts for the UE to read TAC since it is contained together with CGI. But it still needs the change from UE, i.e. legacy UE cannot support it. Seems this is not correction but enhancement. |
| Huawei, HiSilicon |  | This is an addition of new features instead of correction |
| ZTE |  | We share the same view with Huawei. We also think this is a feature, not a correction. |
| vivo | No | This is enhancement not correction. |
| Nokia | No | We do not prefer to introduce enhancements to a frozen release. We also think this is an enhancement and not an essential correction. |
| Qualcomm | No | This has already been discussed at RAN2#112e (where neighbour CGIs were proposed instead of TAC). The problem that a "location server may not have the information of all the cells in its database" would be a general problem, which is not restricted to GNSS Periodic Assistance Data Delivery Procedure. This would affect all positioning methods and would probably require improved OAM procedures, but not LPP changes. |
| Samsung | NO | Same view with others. |
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**Summary 7**: There is no clear majority to agree to the CR. Majority companies think this is an enhancement. One company think this is a generic problem for all positioning methods and should be addressed by improved OAM procedures and not by LPP changes while another company think it may be beneficial for GNSS positioning only and not for other positioning methods.

**Proposal 7**: CR in R2-2101382 is not agreed.

# 3 Conclusion

The following are the proposals resulting from the email discussion “[AT113-e][612][POS] LPP proposals”:

**Proposal 1**: CR in R2-2100405 is not agreed, especially given that there is a difference in view about the usage of ul-srs codepoint. Proponent may discuss offline with other companies to see if there is interest to come back to this issue in the next meeting.

**Proposal 2**: CR in R2-2100406 is agreed for Rel-16 with updates to CR cover sheet. CR cover updates should add the magic sentence to make the change applicable for earlier releases and must fix the work item code.

**Proposal 3**: CR in R2-2101384 is not agreed as is. Proponent may discuss offline with other companies to see if there is interest to agree on a modified text proposal.

**Proposal 4**: The changes in CR in R2-2101827 is agreed but it should be implemented using the latest baseline specification and updates to CR cover sheet are required. CR cover updates must fix the affected clauses, CR revision, work item code.

**Proposal 5**: Proposals in R2-2101828 are not agreed. Proponent may discuss offline with other companies to see if there is interest to come back to this issue in the next meeting with a CR.

**Proposal 6**: Proposals in R2-2101858 are not agreed. Proponent may discuss offline with other companies to see if there is interest to come back to this issue in the next meeting with a CR.

**Proposal 7**: CR in R2-2101382 is not agreed.

# Annex – Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Nokia (Rapporteur) | Mani Thyagarajan | [mani.thyagarajan@nokia.com](mailto:mani.thyagarajan@nokia.com) |
| Lenovo | Hyung-Nam Choi | hchoi5@lenovo.com |
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