3GPP TSG-RAN WG1 Meeting #110 R1-22xxxxx

Toulouse, France, 22nd – 26th August 2022

**Agenda Item: 8.6**

**Title: FL summary #1 for Rel-17 RedCap maintenance**

**Source: Moderator (Ericsson)**

**Document for: Discussion, Decision**

# 1 Introduction

This feature lead (FL) summary (FLS) concerns the Rel-17 work item (WI) for support of reduced capability (RedCap) NR devices [1, 2]. Earlier RAN1 agreements for this WI are summarized in [3], and the FLSs from the previous RAN1 meeting can be found in [4, 5, 6, 7, 8].

This document summarizes the contributions [9] – [45] submitted to agenda item 8.6 and captures this email discussion:

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| [110-R17-RedCap] To be used for sharing updates on online/offline schedule, details on what is to be discussed in online/offline sessions, Tdoc number of the moderator summary for online session, etc – Johan (Ericsson) |

The section numbering in this document follows the draft TR structure in [4]. The issues that are in the focus of the initial round of the discussion are tagged FL1.

Follow the naming convention in this example:

* *RedCapMaintenanceFLS1-v000.docx*
* *RedCapMaintenanceFLS1-v001-CompanyA.docx*
* *RedCapMaintenanceFLS1-v002-CompanyA-CompanyB.docx*
* *RedCapMaintenanceFLS1-v003-CompanyB-CompanyC.docx*

If needed, you may “lock” a discussion document for 30 minutes by creating a checkout file, as in this example:

* Assume CompanyC wants to update *RedCapMaintenanceFLS1-v002-CompanyA-CompanyB.docx*.
* CompanyC uploads an empty file named *RedCapMaintenanceFLS1-v003-CompanyB-CompanyC.checkout*
* CompanyC checks that no one else has created a checkout file simultaneously, and if there is a collision, CompanyC tries to coordinate with the company who made the other checkout (see, e.g., contact list below).
* CompanyC then has 30 minutes to upload *RedCapMaintenanceFLS1-v003-CompanyB-CompanyC.docx*
* If no update is uploaded in 30 minutes, other companies can ignore the checkout file.
* Note that the file timestamps on the server are in UTC time.

In file names, please use the hyphen character (not the underline character) and include ‘v’ in front of the version number, as in the examples above and in line with the general recommendation (see slide 12 in [R1-2205703](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205703.zip)), otherwise the sorting of the files will be messed up (which can only be fixed by the RAN1 secretary).

To avoid excessive email load on the RAN1 email reflector, please note that there is NO need to send an info email to the reflector just to inform that you have uploaded a new version of this document. Companies are invited to enter the contact info in the table below.

**FL1 Question 1-1: Please consider entering contact info below for the points of contact for this email discussion.**

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| **Company** | **Point(s) of contact** | **Email address(es)** |
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# 2 BWP operation

2.1 SSB presence in 38.213

RAN1#109e discussed several text proposals (TPs) for 38.213 clause 17.1 that intended to better capture earlier RAN1 agreements. Contributions [9, 17, 18, 24] propose to adopt similar changes as TP#10 in the RAN1#109e FLS [5], which looked like this:

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| *[The following paragraph captures presence of SSB in idle and inactive modes.]*  For an initial DL BWP provided by *initialDownlinkBWP-RedCap* in *DownlinkConfigCommon~~RedCap~~SIB*, if a UE in RRC\_IDLE state or in RRC\_INACTIVE state monitors PDCCH according to ~~a~~ Type1-PDCCH CSS set and does not monitor PDCCH according to Type2-PDCCH CSS set, the UE ~~assumes that~~ does not expect the initial DL BWP ~~does not~~ to include SS/PBCH blocks ~~or~~ and the CORESET with index 0. If the UE in RRC\_IDLE state or in RRC\_INACTIVE state monitors PDCCH according to Type2-PDCCH CSS set, the UE assumes that the initial DL BWP includes the SS/PBCH blocks that the UE used to obtain SIB1 and, for SS/PBCH block and CORESET multiplexing pattern 1, the CORESET with index 0. ~~if the UE used the SS/PBCH block to obtain SIB1~~  ~~- includes a SS/PBCH block and does not include the CORESET with index 0 if the initial DL BWP does not include the SS/PBCH block the UE used to obtain SIB1~~  ~~For an active DL BWP provided by~~ *~~BWP-DownlinkDedicated~~*~~, a UE assumes that the active DL BWP includes a SS/PBCH block, unless the UE indicates a capability to operate in the DL BWP without receiving an SS/PBCH block, and does not include the CORESET with index 0.~~  *[The following paragraph captures presence of SSB in connected mode for separate initial DL BWP configured by BWP configuration option 1.]*  For an active DL BWP not provided by *BWP-DownlinkDedicated*, unless a UE indicates a capability to operate in the active DL BWP without receiving an SS/PBCH block, the UE in RRC\_CONNECTED state assumes that the active DL BWP includes the SS/PBCH blocks that the UE used to obtain SIB1 and, for SS/PBCH block and CORESET multiplexing pattern 1, the CORESET with index 0.  *[The following paragraph captures presence of SSB in connected mode for non-initial DL BWP configured by BWP configuration option 1 and initial/non-initial DL BWP configured by BWP configuration option 2.]*  For an active DL BWP provided by *BWP-DownlinkDedicated*, unless a UE indicates a capability to operate in the active DL BWP without receiving an SS/PBCH block, the UE in RRC\_CONNECTED state assumes that the active DL BWP includes the SS/PBCH blocks that the UE used to obtain SIB1 or the SS/PBCH blocks provided by *NonCellDefiningSSB*. If the active DL BWP includes the SS/PBCH blocks that the UE used to obtain SIB1, for SS/PBCH block and CORESET multiplexing pattern 1, the UE expects the active DL BWP to include the CORESET with index 0. If the active DL BWP includes the SS/PBCH blocks provided by *NonCellDefiningSSB*, these SS/PBCH blocks and the SS/PBCH blocks that the UE used to obtain SIB1 have the same quasi-colocation properties, if they have the same index. |

Contributions [9, 10, 11, 14, 17, 18, 30, 32 (section 2.2), 35, 36 (section 3)] aim to capture some of or all the agreements that TP#10 aimed to capture. Somewhat related, contribution [11] also proposes to remove the statement that “A UE with reduced capabilities (RedCap UE) supports all Layer-1 UE features that are mandatory without capability signalling” in 38.213 clause 17.

**FL1 Question 2.1-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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2.2 Center frequency alignment in 38.213

As already mentioned, RAN1#109e discussed several TPs for 38.213 clause 17.1 that intended to capture earlier RAN1 agreements. Contributions [16 (issue 1), 17, 18] propose to adopt similar changes as TP#9 in the RAN1#109e FLS [5], which looked like this:

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| A RedCap UE does not expect to receive a configuration where the center frequency for an initial DL BWP in which the UE is configured to monitor Type1-PDCCH CSS set (separate or shared with non-RedCap UEs) is different than the center frequency for an initial UL BWP (separate or shared with non-RedCap UEs) in which the RedCap UE may transmit Msg1/Msg3 or MsgA. |

**FL1 Question 2.2-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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2.3 Maximum bandwidth in 38.213

Contributions [16 (issue 5), 45] propose some clarifications related to the maximum bandwidth in 38.213 clause 17.1.

**FL1 Question 2.3-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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2.4 Common PUCCH resource set determination in 38.213

Contributions [31, 44] propose to clarify the common PUCCH resource set index determination in 38.213 clause 17.1 and to send an LS to ask RAN2 to clarify in 38.331 that RedCap-specific common PUCCH resource is always provided for a RedCap-specific initial UL BWP.

Contributions [36 (section 4), 41] propose a correction of the PUCCH PRB offset parameter name in 38.213 clause 17.1.

**FL1 Question 2.4-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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2.5 Relation between PUSCH and NCD-SSB in 38.213/38.214

Contributions [21, 22, 32 (section 2.3), 34, 40] propose to clarify the relation between PUSCH and NCD-SSB in various subclauses to 38.214 clause 6.1, whereas contribution [39] proposes to clarify this in 38.213 clause 17.1.

**FL1 Question 2.5-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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2.6 PDSCH resource mapping around NCD-SSB in 38.214

Contributions [16 (issue 2), 25, 40] propose to clarify PDSCH resource mapping around NCD-SSB in 38.214 clause 5.1.4.

**FL1 Question 2.6-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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2.7 Relation between control channels and NCD-SSB in 38.213

Contributions [16 (issue 4), 20, 22, 26, 32 (section 2.3), 33] propose to clarify the relations between various control channels and NCD-SSB in one or more of clauses 8.1, 8.1A, 9.2.6, 10, 11.1, 11.1.1 and 19.1 in 38.213.

**FL1 Question 2.7-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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2.8 DCI format 0\_0 size determination in 38.212

Contribution [27] proposes to clarify the DCI format 0\_0 size determination in 38.212 clause 7.3.1.0.

**FL1 Question 2.8-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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2.9 Msg1/MsgA retransmission timeline in 38.213

Contributions [42, 43] propose to make the text about the Msg1/MsgA retransmission timeline in 38.213 clauses 8.2 and 8.2A applicable to non-RedCap UEs only, whereas contribution [36 (section 2)] proposes to add corresponding text in 38.213 clause 17.1 for the case when a RedCap UE performs random access on an active DL BWP with SSB.

**FL1 Question 2.9-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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# 3 HD-FDD operation

3.1 PUSCH repetition corrections in 38.214

Contributions [13 (section 3), 16 (issue 3), 19, 28, 29, 37, 38] propose various PUSCH repetition related corrections for HD-FDD in subclauses to 38.214 clause 6.1.2.

**FL1 Question 3.1-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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3.2 PUSCH repetition corrections in 38.213

Contribution [13 (section 2] proposes PUSCH repetition related corrections for HD-FDD in 38.213 clause 17.2.

**FL1 Question 3.2-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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3.3 UE processing capability clarification in 38.213

Contribution [23] proposes clarifications related to UE processing capability for HD-FDD in 38.213 clause 17.2.

**FL1 Question 3.3-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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# 4 SDT operation

Contribution [12] contains several proposals related to small data transmission (SDT) operation for RedCap UEs. Contribution [32 (section 2.1)] proposes that it should be up to the UE implementation whether and how a UE monitors SI change indication during an SDT procedure in a separate initial DL BWP not containing CD-SSB. The FL suggestion is to postpone these proposals for the combination of RedCap and SDT until the RedCap specifications on one hand and the SDT specifications on the other hand are a bit more stable.

**FL1 Question 4-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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# 5 SSB-less BWP

5.1 Measurements gaps

Contribution [36 (section 6)] proposes to update 38.213 and 38.822 to capture a RedCap UE’s need for measurement gaps to use SSB outside its BWP based on a potential LS reply from RAN4.

**FL1 Question 5.1-1: Companies are invited to provide comments and suggested priority (1=Low, 2=Med, 3=High).**

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| **Company** | **Priority** | **Comments** |
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5.2 CSI-RS based RLM

Contribution [15] proposes to include capability of CSI-RS based RLM (FG 1-7) into FG 28-1a and to reuse existing specifications for RLM on PCell. The FL suggests treating this topic under UE feature list agenda item 8.16.5 instead.

# 6 NCD-SSB time offset parameter

Contribution [36] section 5 concerns the definition and values of the recently introduced NCD-SSB time offset parameter. It can be discussed together with the incoming LS in [46] and the related contributions in [47] – [53] which also concern the definition and values of that parameter (after the Monday LS session).

# References

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| --- | --- | --- | --- |
| [1] | [RP-220966](https://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_95e/Docs/RP-220966.zip) | Revised WID on support of reduced capability NR devices | Ericsson |
| [2] | [R1-221163](https://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_96/Docs/RP-221163.zip) | Summary of WI on support of reduced capability (RedCap) NR devices | Ericsson |
| [3] | [R1-2205427](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2205427.zip) | RAN1 agreements for Rel-17 NR RedCap | Rapporteur (Ericsson) |
| [4] | [R1-2205107](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2205107.zip) | FL summary for preparatory phase for Rel-17 RedCap maintenance | Moderator (Ericsson) |
| [5] | [R1-2205428](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2205428.zip) | FL summary for maintenance on UE bandwidth reduction for RedCap | Moderator (Ericsson) |
| [6] | [R1-2205429](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2205429.zip) | FL summary for incoming LS ([R1-2203046](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2203046.zip)) on introduction of an offset to transmit CD-SSB and NCD-SSB at different times | Moderator (Ericsson) |
| [7] | [R1-2205364](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2205364.zip) | FL summary #1 for maintenance on HD-FDD for RedCap | Moderator (Qualcomm) |
| [8] | [R1-2205442](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2205442.zip) | FL summary #2 for maintenance on HD-FDD for RedCap | Moderator (Qualcomm) |
| [9] | [R1-2205738](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205738.zip) | Corrections and clarifications of RedCap UE procedures | Ericsson |
| [10] | [R1-2205788](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205788.zip) | Correction on separate initial DL/UL BWP for RedCap UEs | Huawei, HiSilicon |
| [11] | [R1-2205789](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205789.zip) | Corrections related to NCD-SSB for RedCap UEs | Huawei, HiSilicon |
| [12] | [R1-2205974](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205974.zip) | Remaining issues on support of Reduced Capability NR Devices | Spreadtrum Communications |
| [13] | [R1-2206298](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206298.zip) | Other remaining issues for Reduced Capability NR Devices | OPPO |
| [14] | [R1-2206369](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206369.zip) | Correction on Type2-PDCCH CSS configuration in separate initial DL BWP | CATT |
| [15] | [R1-2206416](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206416.zip) | Remaining details on BWP operation for RedCap | NEC |
| [16] | [R1-2206442](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206442.zip) | Maintenance Issues on Complexity Reduction for RedCap | Nokia, Nokia Shanghai Bell |
| [17] | [R1-2206546](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206546.zip) | Draft CR on corrections to BWP operations for RedCap UEs | Intel Corporation |
| [18] | [R1-2206547](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206547.zip) | Remaining details on BWP operations for RedCap UEs | Intel Corporation |
| [19] | [R1-2206548](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206548.zip) | Draft CR on correction to handling of Types A and B PUSCH repetitions for HD-FDD RedCap UEs | Intel Corporation |
| [20] | [R1-2206549](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206549.zip) | Draft CR on corrections for handling of NCD-SSB for RedCap UEs | Intel Corporation |
| [21] | [R1-2206550](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206550.zip) | Draft CR on corrections for PDSCH reception in BWP configured with NCD-SSB for RedCap UEs | Intel Corporation |
| [22] | [R1-2206551](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206551.zip) | Discussion on NCD-SSB handling for RedCap UEs | Intel Corporation |
| [23] | [R1-2206616](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206616.zip) | Corrections on Half-duplex FDD operation in paired spectrum in TS 38.213 | Xiaomi |
| [24] | [R1-2206746](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206746.zip) | Corrections for RedCap UE behavior on BWP operation | vivo |
| [25] | [R1-2206747](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206747.zip) | Correction on PDSCH resource mapping around NCD-SSB for RedCap UE | vivo |
| [26] | [R1-2206748](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206748.zip) | Correction on PDCCH monitoring for RedCap UE | vivo |
| [27] | [R1-2206749](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206749.zip) | Corrections on DCI format 0\_0 size determination for RedCap UE | vivo |
| [28] | [R1-2206750](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206750.zip) | Correction on available slot determination for PUSCH repetition type A for HD-FDD | vivo |
| [29] | [R1-2206751](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206751.zip) | Correction on invalid symbol determination for PUSCH repetition type B for HD-FDD | vivo |
| [30] | [R1-2206888](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206888.zip) | Correction on SSB transmission for initial DL BWP | CMCC |
| [31] | [R1-2207000](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207000.zip) | Correction for PUCCH resource set indication for RedCap | MediaTek Inc. |
| [32] | [R1-2207045](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207045.zip) | Discussion on RedCap remaining issues | ZTE, Sanechips |
| [33] | [R1-2207046](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207046.zip) | Correction on NCD-SSB related spec for RedCap in TS38.213 | ZTE, Sanechips |
| [34] | [R1-2207047](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207047.zip) | Correction on NCD-SSB related spec for RedCap in TS38.214 | ZTE, Sanechips |
| [35] | [R1-2207048](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207048.zip) | Correction on SSB and CORESET#0 presence for RedCap | ZTE, Sanechips |
| [36] | [R1-2207196](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207196.zip) | Maintenance on NR R17 RedCap UE | Qualcomm Incorporated |
| [37] | [R1-2207272](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207272.zip) | Corrections on available slot counting for PUSCH repetition type A for HD-UE | Sharp |
| [38] | [R1-2207273](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207273.zip) | Corrections on inclusion of NCD-SSB and switching gap for determining invalid symbols for PUSCH repetition type B for HD-UE | Sharp |
| [39] | [R1-2207274](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207274.zip) | Corrections on collision handling between NCD-SSB and UL transmission in TS38.213 for RedCap UE in unpaired spectrum | Sharp |
| [40] | [R1-2207275](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207275.zip) | Corrections on inclusion of NCD-SSB in TS38.214 for RedCap UE | Sharp |
| [41] | [R1-2207276](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207276.zip) | Correction on RRC parameter alignment for additional PRB offset in TS38.213 for RedCap UE | Sharp |
| [42] | [R1-2207383](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207383.zip) | Draft CR on timeline requirement for retransmitting MSG1/MSGA for RedCap | NTT DOCOMO, INC. |
| [43] | [R1-2207384](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207384.zip) | Discussion on timeline requirement for retransmitting MSG1/MSGA for RedCap | NTT DOCOMO, INC. |
| [44] | [R1-2207494](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207494.zip) | On PUCCH resource set indication for RedCap | MediaTek Beijing Inc. |
| [45] | [R1-2207669](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207669.zip) | Correction on separate initial UL BWP for RedCap UEs | Huawei, HiSilicon |
| [46] | [R1-2205734](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205734.zip) | Reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times | RAN2, Ericsson |
| [47] | [R1-2205761](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2205761.zip) | On the offset between CD-SSB and NCD-SSB | Huawei, HiSilicon |
| [48] | [R1-2206415](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206415.zip) | Discussion on LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times | NEC |
| [49] | [R1-2206441](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206441.zip) | Discussion on reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB | Nokia, Nokia Shanghai Bell |
| [50] | [R1-2206483](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206483.zip) | On the Reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times | Ericsson |
| [51] | [R1-2206704](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2206704.zip) | Draft reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times | vivo |
| [52] | [R1-2207044](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207044.zip) | Discussion on LS reply for time offset between CD-SSB and NCD-SSB | ZTE, Sanechips |
| [53] | [R1-2207614](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110/Docs/R1-2207614.zip) | Draft Reply LS on introduction of an offset to transmit CD-SSB and NCD-SSB at different times | Ericsson |