3GPP TSG-RAN WG2 #117-e Tdoc R2-220XXXX

Electronic meeting, Feb 21st – Mar 3rd, 2022

Agenda Item: 8.12.2.2.1

Source: Ericsson (Rapporteur)

Title: Email discussion report for [AT117-e][105][RedCap] CP open issues

Document for: Discussion, Decision

# 1 Introduction

Prior to RAN2#117-e, there was an offline discussion based on the list of open issues captured in [R2-2201887](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201887.zip) and [R2-2201889](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201889.zip) as the outcome of the related offline discussions after RAN2#116bis-e regarding TS 38.331 and TS 38.304, respectively. The outcome of this discussion is captured in [R2-2203502](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203502.zip).

In [R2-2203502](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203502.zip), the following observations were made

**Observation 1** It is up to network implementation to configure MO on CD-SSB (in addition to configuring a MO on NCD-SSB) even if the network does not expect the UE to perform neighbor cell measurements thereon.

**Observation 2** It is up to network implementation, but it is expected that the network configures a MO on the NCD-SSB frequency if it wants the UE to use it only for serving cell measurements when some neighbor cells do not send an SSB on UE’s NCD-SSB frequency.

**Observation 3** It is up to network implementation, but it is expected that network refers to MO on NCD-SSB explicitly from within the ServingCell configuration (similarly to servingCellMO) when some neighbor cells do not send an SSB on UE’s NCD-SSB frequency.

**Observation 4** It is possible for the network to configure a UE with multiple NCD-SSBs.

**Observation 5** It is sufficient to configure at least one of the MOs configured on CD-SSB or NCD-SSB in the current active BWP, if contained, in servingCellMO.

and the rapporteur proposed the following based on the discussion:

**Proposals for agreement**

**Proposal 3** The following working assumption is confirmed: “System information can provide information on which frequencies accept RedCap UE access (e.g. by considering whether supporting RedCap)”

**Proposal 5** The invalid configuration where INACTIVE eDRX cycle is configured but IDLE eDRX cycle is not configured, is captured in the field description of the parameter *ran-ExtendedPagingCycle*.

**Proposal 6** The invalid configuration where INACTIVE eDRX cycle is longer than IDLE eDRX cycle, is captured in the field description of the parameter *ran-ExtendedPagingCycle*.

**Proposal 9** In Rel-17, one spare value is sufficient for the parameter ExtendedPagingCycle-r17.

**Proposal 12** For the handover case; if the target gNB does not configure RRM relaxation for a UE, the UE shall not perform the evaluation of the Relaxed measurement criterion for a stationary UE, i.e. the UE shall not perform the procedural text of 5.7.4.X.

**Proposal 13** When network configures both R16/R17 relaxation criteria and the UE fulfils both, it is up to UE implementation to perform either Rel-16 or Rel-17 relaxation method.

**Proposal 14** It is up to UE implementation when to start the RRM relaxation if multiple methods are configured.

**Proposal 15** A MO is configured on the NCD-SSB for the UE to perform neighbour cell measurement (as in legacy).

**Proposal 16** *servingCellMO* is configured to the MO on the CD-SSB when RedCap specific BWP of a UE contains neither CD-SSB nor NCD-SSB.

**Proposal 17** There is no need to restrict the network from configuring a UE with multiple NCD-SSBs.

**Proposal 18** The working assumption “The periodicity of NCD-SSB shall be not less than the periodicity of serving cell’s CD-SSB.” is confirmed.

**Proposal 19** It is not possible to indicate NCD-SSB in the handover command.

**Proposal 20** The discussion on whether a non-RedCap UE should be able to use NCD-SSB instead of CD-SSB is deprioritized in Rel-17.

**Proposals for further discussion**

**Proposal 1** Discuss whether UE should consider IFRI as “allowed” or follows the IFRI in MIB when i) cell does not indicate support for RedCap UEs or ii) Red Cap UE is unable to acquire SIB1.

**Proposal 2** Discuss whether UE should follow legacy IFRI in MIB or acquire SIB1 and follow the RedCap-specific IFRI provided in SIB1 when cellBarred in MIB is set to barred.

**Proposal 4** Support for Half-Duplex FDD RedCap is indicated in SIB1.

**Proposal 7** UE should consider the RRC\_IDLE eDRX cycle for comparing with the modification period for both RRC\_IDLE and RRC\_INACTIVE to decide if eDRX acquisition period is used.

**Proposal 8** If Proposal 7 is agreed, it is captured with the following change in TS 38.331:

2>          if the UE is in RRC\_IDLE, configured with an eDRX cycle longer than the modification period and the *systemInfoModification-eDRX* bit of Short Message is set:

**Proposal 10** Working assumption: The number of most significant bits that should be used for UE\_ID\_H is 12.

**Proposal 11** Discuss whether 13 bits should be used instead as the number of most significant bits that is used for UE\_ID\_H.

Note: The rapporteur would like to update Proposal 17 above as follows: “A RedCap UE may be configured with with multiple NCD-SSBs.”

Contact information

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# 2 Discussion

### 2.1 Feedback based on the outcome of the Pre117-e offline

**Q 2.1.1** Do you have any comments/suggestions regarding the proposals for agreement above? Please elaborate your reply and provide an alternative formulation that addresses your concerns while capturing the feedback from other companies provided during the Pre-117-e offline.

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| **Company** | **Comments** |
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**Summary – Q 2.1.1**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

In [R2-2203502](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203502.zip), ZTE and MediaTek indicated in their replies to Q2.2.6 that if 12 bits were to be used, we would end up with 4 PTW\_start positions instead of 8, as intended, when TeDRX,H is equal to 1024 Hyper-frames. Some companies think it would be good to discuss this aspect further based on the feedback provided by ZTE and MediaTek.

**Q 2.1.2** Do you agree that the number of most significant bits used for UE\_ID\_H should be 13? Please elaborate your reply.

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| **Company** | **Yes/No** | **Comments** |
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**Summary – Q 2.1.2**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

### 2.2 Discussion based on AI 8.12.4 on NCD-SSB aspects

In this section, companies are expected to provide feedback based on the Tdocs below:

[R2-2202318](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202318.zip) Discussion on RAN2 impacts on NCD-SSB and separate initial BWP vivo, Guangdong Genius

[R2-2202653](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202653.zip) Remaining issues on separate initial BWP and NCD-SSB for RedCap UEs ZTE Corporation, Sanechips

[R2-2202998](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202998.zip) Left open issues on NCD-SSB OPPO

[R2-2203057](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203057.zip) Discussion on NCD-SSB aspects for RedCap UE Huawei, HiSilicon

[R2-2203078](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203078.zip) Discussion on the open issues of NCD-SSB CATT

[R2-2203505](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203505.zip) Monitoring POs in connected mode when using NCD-SSB Ericsson

[R2-2203508](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203508.zip) C-plane related open issues on NCD-SSB DENSO CORPORATION

In [6], the following proposals are made:

**Proposal 1** From RAN2 perspective, NCD-SSB should be used for the measurement for RLM/BFD in connected mode if the active BWP including NCD-SSB but without CD-SSB. The corresponding requirements for NCD-SSB measurement should be discussed and determined in RAN4.

**Proposal 2** From RAN2 perspective, NCD-SSB should be used for the measurement for RRM measurement of serving cell and neighbouring cell(s) in connected mode if the active BWP including NCD-SSB but without CD-SSB. The corresponding requirements for NCD-SSB measurement should be discussed and determined in RAN4.

**Proposal 3** If PRACH occasions on the active BWP is not configured for Redcap, RedCap UEs shall use the RedCap-specific initial UL BWP, if configured, to perform RACH.

The rapporteur assumes that Proposals 1 and 2 have been covered in the offline discussion [105]. In RAN2#116bis-e, the following agreement was made: “If a RedCap-specific initial UL BWP is configured for RACH, RedCap UEs shall use only the RedCap-specific initial UL BWP to perform RACH.” Regarding proposal 3; considering that this agreement was made within the context of idle/inactive mode, the rapporteur thinks it would be good to have a discussion on the connected mode related aspects.

**Q 2.2.1** If RA occasions are not configured on the active BWP, do you think that RedCap UEs should use the RedCap-specific initial UL BWP, if configured? Please elaborate your reply.

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**Summary – Q 2.2.1**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

In [7], the following proposals are made:

**Proposal 1** For RedCap-specific BWP, both common and dedicate configuration are provided using full configuration. Delta configuration compared to legacy initial BWP is not supported.

**Proposal 2** In case RedCap-specific initial DL BWP contains CD-SSB, the PDCCH-ConfigCommon should include common search space configurations for paging, RAR, SIB1 and OSI. Absence of the field means the UE does not receive corresponding message (same as in legacy). For SIB1 and OSI, the search space configurations are aligned with the configurations in legacy initial DL BWP.

**Proposal 3** If RedCap-specific initial BWP is configured, the cell barring determination is performed based on the bandwidth of RedCap-specific initial BWP instead of legacy initial BWP.

**Proposal 4** For RedCap in RRC Connected mode, to discuss whether the network is allowed to only configure the common part of RedCap-specific initial BWP (as for legacy initial BWP).

**Proposal 5** RedCap UE should mandatorily support RedCap-Specific initial BWP.

**Proposal 6** NCD-SSB is per cell configured, not per BWP. The frequency and periodicity configuration of NCD-SSB can be defined in ServingCellConfig.

**Proposal 7** One BWP contains more than one SSBs (e.g. CD-SSB and/or NCD-SSB) is not supported in Rel-17.

The rapporteur assumes that Proposal 5 needs to be discussed in RAN1 and there is no need to discuss Proposal 3 assuming that configuring a RedCap-specific initial BWP with a larger bandwidth than a RedCap can support is misconfiguration. Proposals 6 and 7 have been covered in the offline discussion [105]. The rest of the proposals are addressed below:

**Q 2.2.2** For RedCap-specific BWP, do you think both common and dedicated configurations should be provided using full configuration, i.e., delta configuration is not supported. Please elaborate your reply.

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**Summary – Q 2.2.2**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.2.3** In case RedCap-specific initial DL BWP contains CD-SSB, do you think *PDCCH-ConfigCommon* should include common search space configurations for paging, RAR, SIB1 and OSI? Please elaborate your reply and comment on whether search space configurations for SIB1 and OSI should be aligned with the configurations in legacy initial DL BWP.

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**Summary – Q 2.2.3**

TBD

Based on the observations above, the rapporteur proposes the following:

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**Q 2.2.4** For a RedCap UE in connected mode, do you think it should be restricted for the network to provide a dedicated configuration of a RedCap-specific initial BWP? Please elaborate your reply.

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**Summary – Q 2.2.4**

TBD

Based on the observations above, the rapporteur proposes the following:

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In [8] the following proposals are made:

**Proposal 1** NCD-SSB is applicable only for RedCap UEs.

**Proposal 2** There is no impact of NCD-SSB based RRM/RLM on BWP operation.

The rapporteur assumes that Proposals 1 and 2 have been covered in the offline discussion [105].

In [9], the following proposals are made:

**Proposal 1** Multiple NCD-SSB can be configured to one RedCap UE.

**Proposal 2** For serving cell measurement based on NCD-SSB in connected mode, MeasObjectId is configured for each NCD-SSB.

**Proposal 3** For serving cell measurement based on NCD-SSB, UE’s serving cell measurement object is the ssbFrequency associated with the NCD-SSB of its active BWP (i.e. UE changes the MO of servicing cell upon BWP switching).

**Proposal 4** NW can configure the time offset for NCD-SSB to RedCap UEs, e.g. using periodicityAndOffset.

**Proposal 5** In connected mode, neighbour cell measurements based on NCD-SSB is NOT supported for RedCap UEs.

**Proposal 6** Not to support non-RedCap UE using NCD-SSB instead of CD-SSB.

The rapporteur assumes that Proposals 1, 2, 3, 5 and 6 have been covered in the offline discussion [105].

**Q 2.2.5** Do you think it should be possible for the network to transmit CD-SSB and NCD-SSB(s) at different times by configuring an offset? Please elaborate your reply.

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**Summary – Q 2.2.5**

TBD

Based on the observations above, the rapporteur proposes the following:

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In [10], the following proposals are made:

**Proposal 1** A RedCap UE, which does not support CSI-RS, should be able to report “Not need NCD-SSB” as an optional UE capability

LS can be sent to RAN1 to confirm the motivation of “Not need NCD-SSB” if necessary

**Proposal 2** A non-RedCap UE should not be able to use NCD-SSB instead of CD-SSB with an optional capability at least in Rel-17.

The rapporteur assumes that Proposals 2 has been covered in the offline discussion [105] and for Proposal 1 it is rapporteur’s understanding that this is already agreed in RAN1 so there is no need for further discussion or confirmation.

In [11], the following proposal is made:

**Proposal 1** Discuss whether/how to introduce a mechanism for the network to provide SI or SIB6/SIB7/SIB8 to a UE configured with a DL BWP that does not contain CD-SSB after a notification for system information update or ETWS and/or CMAS is transmitted.

**Q 2.2.6** Do you think that a mechanism for the network to provide SI or SIB6/SIB7/SIB8 to a UE configured with a DL BWP that does not contain CD-SSB after a notification for system information update or ETWS and/or CMAS is transmitted? Please elaborate your reply and “how”, especially if you reply “Yes”.

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**Summary – Q 2.2.6**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

In [12], the following proposals are made:

**Proposal 1** Upon submitting the RRCSetupRequest/RRCResumeRequest message to the lower layer, if the RedCap UE is in the separate DL BWP where CD-SSB is not present, the RedCap UE does not have to continue cell re-selection related measurements as well as cell re-selection evaluation.

**Proposal 2** Upon the failure of RRC connection setup/resume, if the RedCap UE is in the separate DL BWP where CD-SSB is not present, the RedCap UE moves back to the default initial DL BWP where CD-SSB is present.

**Q 2.2.7** Upon submitting the *RRCSetupRequest/RRCResumeRequest* message to the lower layers, if the RedCap UE is in the separate DL BWP where CD-SSB is not present, do you think that RedCap UE should not continue cell re-selection related measurements as well as cell re-selection evaluation? Please elaborate your reply.

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**Summary – Q 2.2.7**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

**Q 2.2.8** Upon failure of *RRC connection setup/resume*, if the RedCap UE is in the separate DL BWP where CD-SSB is not present, do you think that RedCap UE should move back to the default initial DL BWP where CD-SSB is present? Please elaborate your reply.

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**Summary – Q 2.2.8**

TBD

Based on the observations above, the rapporteur proposes the following:

1. ???

# 3 Conclusion

Based on the discussion above the following proposals have been made:

[Proposal 1 ???](#_Toc96429434)

[Proposal 2 ???](#_Toc96429435)

[Proposal 3 ???](#_Toc96429436)

[Proposal 4 ???](#_Toc96429437)

[Proposal 5 ???](#_Toc96429438)

[Proposal 6 ???](#_Toc96429439)

[Proposal 7 ???](#_Toc96429440)

[Proposal 8 ???](#_Toc96429441)

[Proposal 9 ???](#_Toc96429442)

[Proposal 10 ???](#_Toc96429443)

# References

1. [R2-2201886](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201886.zip) Running 331 CR for RedCap Ericsson
2. [R2-2201887](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201887.zip) Open issue list for 38.331 for RedCap Ericsson
3. [R2-2201888](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201888.zip) Running 304 CR for RedCap Ericsson
4. [R2-2201889](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201889.zip) Open issue list for 38.304 for RedCap Ericsson
5. [R4-2201780](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_101-bis-e/Docs//R4-2201780.zip) Discussion on the use of NCD-SSB MediaTek
6. [R2-2202318](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202318.zip) Discussion on RAN2 impacts on NCD-SSB and separate initial BWP vivo, Guangdong Genius
7. [R2-2202653](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202653.zip) Remaining issues on separate initial BWP and NCD-SSB for RedCap UEs ZTE Corporation, Sanechips
8. [R2-2202998](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2202998.zip) Left open issues on NCD-SSB OPPO
9. [R2-2203057](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203057.zip) Discussion on NCD-SSB aspects for RedCap UE Huawei, HiSilicon
10. [R2-2203078](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203078.zip) Discussion on the open issues of NCD-SSB CATT
11. [R2-2203505](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203505.zip) Monitoring POs in connected mode when using NCD-SSB Ericsson
12. [R2-2203508](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_117-e/Docs/R2-2203508.zip) C-plane related open issues on NCD-SSB DENSO CORPORATION