3GPP TSG-RAN WG2 #118-e draftTdoc R2-2206218

Electronic meeting, 9th - 20th May 2022

Agenda Item: 6.12.2.2

Source: Ericsson (Rapporteur)

Title: Report from [AT118-e][102][RedCap] RRC CR (Ericsson) – PH2

Document for: Discussion, Decision

# 1 Introduction

This is the report from the second phase of the offline discussion below:

**[AT118-e][102][RedCap] RRC CR (Ericsson)**

Updated scope: 1. continue the discussion on the remaining RedCap WI-specific RILs, based on [R2-2206192](file:///C%3A%5CData%5C3GPP%5CRAN2%5CInbox%5CR2-2206192.zip); 2. For inter-RAT mobility from LTE to NR, discuss what happens if the UE accesses a 20MHz non-RedCap cell / whether it’s acceptable not to specify a new UE behaviour; 3. For RSRP threshold offset for 1Rx UE, discuss whether the offset should be configurable (vs hard-coded in RAN4 spec) and also draft the LS to RAN4 according to agreements.

Updated intended outcome: Summary of the offline discussion with:

·         List of RILs for email agreement

·         List of RILs for online discussion

·         Conclusion on UE behaviour when the UE is handed  over to a 20MHz non-RedCap cell

·         Conclusion on configurability for offset for 1Rx UE

·         Draft LS to RAN4

Deadline (for companies' feedback): Tuesday 2022-05-17 20:00 UTC

Deadline (for rapporteur's summary in R2-2206218): Tuesday 2022-05-17 22:00 UTC

Proposals/TP marked "for agreement" in R2-2206218 not challenged until Wednesday 2022-05-18 10:00 UTC will be declared as agreed via email by the session chair.

Status: ongoing

In RAN2#118-e, there was an online discussion which was captured in [R2-2206192](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206192.zip). During the online discussion the following agreements were made:

**Agreements**:

1. The following RILs are agreed: H506, V163, H509, H514, Z033, H515, M608, H517, V161, Z034, H522
2. The following RILs are agreed: V168, V169
3. The following RILs are not pursued: X115, X112, V165, H525, H526.
4. O374 is not pursued.
5. X116 is not pursued.
6. RIL 510 is agreed.
7. FW001 is agreed.
8. S952 is not pursued
9. Z035 is agreed with the following change: "The NW configures SSB-based RA (and hence RACH-ConfigCommon) only for UL BWPs if the linked DL BWPs (same bwp-Id as UL-BWP) are the initial DL BWPs or DL BWPs containing the SSB associated to the initial DL BWP or for RedCap UEs DL BWPs associated with *nonCellDefiningSSB*."
10. V164 is not pursued.
11. H513 and H516 are not pursued.
12. H518 is not pursued.
13. X119-2 is not pursued.
14. V166 is not pursued.
15. Number of Rx supported by a RedCap UE is provided in *UERadioPagingInformation*.

In this document we continue the discussion for the following proposals, and the discussions on inter-RAT mobility from LTE to NR and RSRP threshold offset for 1Rx UE:

**Proposals for further discussion**

Proposal 3 Discuss H704.

Proposal 4 The following RIL is agreed: H705 (as captured in R2-2206021).

Proposal 5 For H520 wait until the related discussion in offline 105 is concluded.

Proposal 7 The following RILs are agreed: X110, X111.

Proposal 8 Discuss I051 and N016.

Proposal 10 V162 is agreed with the following change; replace “consider“ with “perform

Proposal 12 H507 is agreed in principle; discuss how to implement the change, i.e., NOTE and/or normative text.

Proposal 16 Discuss H511/ C271 regarding whether the parameter should indicate “allow” or “reject”.

Proposal 17 For H512 wait until the related discussion in offline 105 is concluded.

Proposal 19 Discuss Z036, N107, and H523.

Proposal 20 Discuss X119-1.

Proposal 25 Discuss X114.

Proposal 26 Discuss S953.

Proposal 29 Regarding the indication for DRX support in idle and inactive mode; wait until the related discussion in offline 110 is concluded.

Proposal 30 Discuss whether UEs configured with eDRX should consider stored system information to be invalid after 24 hours.

# Contact Information

Please fill in the following table for contact information:

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| --- | --- |
| Company | Contact person - email@address.com |
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# 2 Discussion on RILs and open issues

## 2.1 Remaining RILs to discuss

**Q 2.1.1** In phase 1, 2 companies think further discussion is required for H704.Considering the discussion in R2-2205512, do you think it should be possible to apply the NCD-SSB functionality to non-RedCap UEs?

Please elaborate your reply, especially if you do and provide a detailed evaluation of the potential changes/discussion required to adopt such functionality.

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes | As explained in R2-2205512, NCD-SSB can enables the following benefits for non-RedCap UEs:* For network, it offers more configuration flexibility, e.g. in configuring the bandwidth and location of UE’s dedicated BWP, the type of RS to configure for RLM/BFD/PL, etc.
* For UE, narrower BWP can be configured and save its power.

In our understanding, configuration of NCD-SSB is per-cell (not per-UE), so extending NCD-SSB to non-RedCap UEs does not require additional resource commitment from network. And no technical issues have been identified in the previous discussion on extending NCD-SSB to non-RedCap UEs. We therefore suggest companies give the proposal another consideration and support it in R17. |
|  Intel | No | RAN2 already had conclusion on this, 1. The discussion on whether a non-RedCap UE should be able to use NCD-SSB instead of CD-SSB is deprioritized in Rel-17.
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**Summary – Q 2.1.1**

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

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**Q 2.1.2** In phase 1, one company indicated that the change proposed in H705 is not essential and can be postponed.

Do you agree with the change proposed in RIL H705 as implemented in R2-2206021? Please elaborate your reply, especially if you do not, and provide a resolution/text proposal that addresses your concerns considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | It is not essential, but we also do not see any issue to implement it in Rapporteur CR.  |
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**Summary - Q 2.1.2**

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

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**Q 2.1.3** In Phase 1, some companies think that it would be good to wait for H520 until the related discussion in offline 105 is concluded. Considering the status of the discussion in offline 105; do you agree with the change proposed in RIL H520 as implemented in R2-2206021?

Please elaborate your reply, especially if you do not, and provide a resolution/text proposal that addresses your concerns considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | Agree, it is aligned with proposal in 105. |
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**Summary – Q 2.1.3**

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

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**Q 2.1.4** Do you agree with the change proposed in RILs X110 and X111?

Please elaborate your reply, especially if you do not, and provide a resolution/text proposal that addresses your concerns considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | Ok to capture them. |
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**Summary – Q 2.1.4**

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

1. ???

**Q 2.1.5** This question is about RILs I051 and N016. In Phase 1, 9 companies responded in total. 2 companies think RILs I051 and N016 should not be pursued, whereas 6 companies support the change in principle and 1 company thinks further discussion is required.

Do you agree with the changes proposed in RILs I051 and N016 considering the comments provided in phase 1? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns, if you agree with the intention considering the feedback from companies, if provided.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes  | proponents |
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**Summary – Q 2.1.5**

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

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**Q 2.1.6** This question is regarding RIL V162. In total 9 companies responded to the related question in phase 1. 8 companies support the change proposed in V162 in principle and support replacing “consider” with “perform”, whereas one company thinks it would be better to discuss further and 2 companies have the following suggestions to replace “consider cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20]” with

Option 1: “perform barring based on *intraFreqReselectionRedCap* as specified in TS 38.304 [20]” (MTK)

Option 2: “perform barring in accordance with *intraFreqReselectionRedCap* as specified in TS 38.304 [20]” (OPPO)

Based on the discussion in phase 1, rapporteur observes that there is support for replacing “consider” with “perform”. In phase 2, the question is whether further changes, as suggestions above in options 1 and 2 are required.

Do you think that further changes are required in addition to replacing “consider” with “perform”? Please elaborate your reply and if you think further changes are required, indicate which one of the options above you would support.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes | No strong opinion on whether to implement option 1 or option 2.  |
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**Summary – Q 2.1.6**

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

1. ???

**Q 2.1.7** This question is regarding RIL H507. In phase 1, 7 companies responded in total. 4 companies support the change whereas 3 companies think “maybe”

Do you agree with the proposed change in RIL H507? Please elaborate your reply especially if you do and provide your opinion on whether a NOTE, as suggested, would do.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Maybe | No strong opinion on whether the Note should be added. It would be good to capture something in RAN4 spec. |
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**Summary – Q 2.1.7**

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

1. ???

**Q 2.1.8** This question is about RILs H511 and C271. In phase 1, 8 companies responded in total. Two companies do not support the proposed changes, 2 companies do not have any strong view, and 4 companies think that the change is needed.

Do you agree with the changes proposed in RILs H511 and C271? Please elaborate your reply.

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| **Company** | **Yes/No** | **Comments** |
| Intel |  | Do not see strong different between allow or reject. As clarified by Ericsson, it depends on the assumption whether more frequencies support RedCap or not. We are ok to follow majority view on this.  |
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**Summary – Q 2.1.8**

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

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**Q 2.1.9** This question is about RIL H520. In phase 1, 7 companies responded in total, and all companies proposed to wait until the related discussion in offline 105 is concluded.

Rapporteur thinks that this RIL will be resolved as part of the offline discussion [105] and thus suggests that there is no need for further discussion in this offline.

Do you agree with rapporteur’s observation above? Please elaborate your reply, especially if you do not and provide a resolution/text proposal that addresses your concerns.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Yes with comments | Agree with Ericsson’s comments in phase 1 discussion, i.e. only following sentence is needed:“This field is absent for the RedCap specific initial DL BWP, if it does not include CD-SSB and the entire CORESET#0“ |
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**Summary – Q 2.1.9**

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

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**Q 2.1.10** This question is about RILs Z036, N107, and H523. In phase 1, 7 companies responded in total, and companies have a mixture of views so further discussion was required.

Do you agree with the proposed change(s)? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | No | Z036/H523: As commented by ZTE, the sub-fields inside BWP-DownlinkCommon is setupRelease+Need M structure, and therefore Z036 is not needed. N107, not needed.  |
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**Summary – Q 2.1.10**

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

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**Q 2.1.11** This question is about the RIL X119-1. In phase 1, 7 companies responded in total. 4 companies do not support the change, whereas 2 companies support in principle with different suggestions on how it should be captured. One company thinks further discussion may be helpful.

Do you agree with the proposed changes? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | No | Agree ZTE’s analysis in Phase 1, i.e. the field may not be configured during HO.  |
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**Summary – Q 2.1.11**

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

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**Q 2.1.12** This question is about RIL X114. In phase 1, 8 companies responded in total. 2 companies think that the change is not needed, whereas 2 companies stated the opposite. The rest does not have any strong preference or think that further discussion is needed.

Do you agree with the proposed change(s)? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | Maybe  | The issue “whether the scenario is valid or not.” should be discussed in RAN1.“If the RedCap specific initial DL BWP does NOT contain the entire CORESET#, the network configures the *commonControlResourceSet* in *SIB1* for Redcap so that it is NOT contained in the bandwidth of CORESET#0.“ |
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**Summary – Q 2.1.12**

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

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**Q 2.1.13** This question is about RIL S953. In phase 1, 7 companies responded in total. 2 companies think that the change is not needed, whereas 2 companies stated the opposite. The rest of the companies do not have any strong preference or think that further discussion is needed.

Do you agree with the proposed change(s)? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Intel | No | Do not see the need to change anything. We should follow existing SI request, and if Msg1 based SI request cannot be applied, the RedCap UE shall use Msg 3 based SI request.  |
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**Summary – Q 2.1.13**

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

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## 2.2 RRC related issues discussed separately

In this section, we discuss the open RRC related issues brought up in the contributions below:

[R2-2204819](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204819.zip) UE Capability and System Information for eDRX vivo, Guangdong Genius

[R2-2205523](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205523.zip) SIB validity with eDRX MediaTek Inc.

[R2-2204723](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204723.zip) Discussion on inter-RAT mobility from LTE to NR OPPO

[R2-2204814](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2204814.zip) [V170] Discussion on Inter-RAT Mobility from LTE to NR for RedCap vivo, Guangdong Genius

[R2-2205036](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205036.zip) Inter-RAT mobility from LTE to NR Huawei, HiSilicon

[R2-2205904](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205904.zip) Handover from E-UTRA from legacy eNB to legacy gNB Ericsson

[R2-2205786](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205786.zip) RSRP thresholds for 1 Rx RedCap Ues Nokia, Nokia Shanghai Bell

[R2-2206024](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2206024.zip) Configuring margin for 1 Rx RedCap UEs Ericsson

**Q 2.2.1** This question is about the indication for DRX support in idle and inactive mode. Rapporteur has observed that this issue will be resolved as part of the offline discussion [110] and thus suggests that there is no need for further discussion in this offline.

Do you agree with rapporteur’s observation above? Please elaborate your reply, especially if you do not and provide a resolution/text proposal that addresses your concerns.

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| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes | There is another discussion ongoing as rapporteur noted. |
| Qualcomm | Yes |  |
| Intel | Yes | Agree, we do not need to repeat the discussion.  |
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**Summary – Q 2.2.1**

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

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**Q 2.2.2** This question is about whether UEs configured with eDRX should consider stored system information to be invalid after 24 hours. In phase 1, 7 companies responded in total. One company supports the change whereas 2 companies do not. 4 companies think further discussion is required.

Do you agree with the proposal? Please elaborate your reply, regardless of whether you do or not and provide a resolution/text proposal that addresses your concerns considering the feedback from companies in phase 1.

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| **Company** | **Yes/No** | **Comments** |
| Nokia | No | Configuring different system information validity time for different devices will increase the system complexity |
| Qualcomm | No | We think further discussion is needed.In our view, having a single, fixed value for all UEs may not be the right thing for NR. For example, a 24 hr validity time for a UE with 2.56s eDRX cycle might be too long, while it makes sense for a UE with 3-hr eDRX cycle.  |
| Intel | See comment | The intention seems reasonable however it seems more logical if this kind of config is defined as UE-specific (i.e. provided in *RRCRelease*) as the storage requirement may be very different for a UE config with eDRX of 2.56sec vs very long values. In addition, the proposed TP in the procedural text would also need to check whether *eDRX-Allowed* is set by the network. |
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**Summary – Q 2.2.2**

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

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**Q 2.2.3** In RAN2#118-e, there is an ongoing discussion on inter-RAT mobility from LTE to NR for RedCap UEs. The following agreement has been made during the first offline session: “Network implementation should avoid handover attempts from source eNB to legacy gNB that does not support RedCap. FFS is specific UE behaviour should also be specified”

Do you think there is a need to specify UE behaviour to address this scenario? Please elaborate your reply and if you think there is a need to do so provide a text proposal (and the corresponding specification) that addresses your concerns considering the feedback from companies provided during the related online discussion.

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| **Company** | **Yes/No** | **Comments** |
| Nokia | No | Can be left up to NW implementation.  |
| Qualcomm | No | It can be left up network implementation. |
| Intel | No | UE based solution cannot resolve ping-pong issue. We can just rely on existing UE behavior, i.e. if the configuration exceeds the UE capability, or cannot be complied by the UE, then the UE will trigger the reestablishment. We do not see the need to introduce new UE behavior on this.  |
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**Summary – Q 2.2.3**

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

1. ???

**Q 2.2.4** In RAN2#118-e, there is an ongoing discussion on RSRP thresholds for 1 Rx RedCap UEs. The following agreement has been made during the first offline session:

“Send an LS to RAN4 saying that RAN2 understands that RedCap UE with 1 Rx branch applies offset to the all RSRP thresholds which are applicable to RedCap (not only the thresholds explicitly mentioned in the incoming RAN4 LS), asking RAN4 for confirmation. In the LS, also ask RAN4 about their view on whether RedCap UE with 1 Rx branch applies offset to REL-16 low mobility and/or not at cell edge conditions (indicating that RAN2 is not sure about the low mobility condition). FFS if anything else needs to be included in the LS

In R2-2206024, it has been observed that a configurable RSRP offset provides flexibility and is future proof compared to a predefined offset in the specification. The following proposal is made:

“**Introduce a configurable parameter in SIB1 that indicates RSRP offset for UEs with 1 Rx branch.**”

Do you agree with the proposal? Please elaborate your reply, especially if you do not..

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes | Configurability improves the flexibility i.e. NW can choose or adjust the RSRP offset for 1Rx branch devices.  |
| Qualcomm | No | This offset is introduced solely because the hardware difference between 1Rx and 2Rx devices. It is not something configured by network.Some companies mentioned a configurable offset can enable more flexibility in the configuration of cell re/-selection. We do not think this offset is the right tool for that purpose, as it is used by all RSRP related measurement.  |
| Intel | No  | Agree with Qualcomm. |
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**Summary – Q 2.2.4**

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

1. ???

**Q 2.2.5** Regarding the discussion in Q 2.2.4 based on R2-2206024; it has also been observed that without RedCap specific cell (re-)selection criteria, 1 Rx RedCap UEs would experience a smaller cell size than 2 Rx RedCap and legacy UEs. The following proposal has been made to address this issue:

In R2-2206024, it has been observed that a configurable RSRP offset provides flexibility and is future proof compared to a predefined offset in the specification. The following proposal is made:

“**Support optional configuration of RedCap specific Qrxlevmin\_1Rx and Qqualmin\_1Rx.**”

Do you agree with the proposal? Please elaborate your reply, especially if you do not.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes with comments  | These are not the only thresholds which needs the offset. [R2-2205786](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205786.zip) mentions e.g. *cg-SDT-RSRP-ThresholdSSB, sdt-RSRP-Threshold*. Offset for these needs to be agreed as well.  |
| Qualcomm | Yes |  |
| Intel | No  | See our response in Q 2.2.4, we prefer to follow RAN4 conclusion, i.e. fix value.  |
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**Summary – Q 2.2.5**

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

1. ???

# 3 Conclusion

Based on the discussion above rapporteur suggests a discussion on the following proposals:

[Proposal 1 ???](#_Toc103572479)

[Proposal 2 ???](#_Toc103572480)

[Proposal 3 ???](#_Toc103572481)

[Proposal 4 ???](#_Toc103572482)

[Proposal 5 ???](#_Toc103572483)

[Proposal 6 ???](#_Toc103572484)

[Proposal 7 ???](#_Toc103572485)

[Proposal 8 ???](#_Toc103572486)

[Proposal 9 ???](#_Toc103572487)

[Proposal 10 ???](#_Toc103572488)

[Proposal 11 ???](#_Toc103572489)

[Proposal 12 ???](#_Toc103572490)

[Proposal 13 ???](#_Toc103572491)

[Proposal 14 ???](#_Toc103572492)

[Proposal 15 ???](#_Toc103572493)

[Proposal 16 ???](#_Toc103572494)

[Proposal 17 ???](#_Toc103572495)

[Proposal 18 ???](#_Toc103572496)

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