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

Online, Jan 25 – Feb 5, 2021

**Agenda item:** 6.15

**Source:** China Telecom

**Title:** Draft-Summary of [AT113-e][027][R4 Other] Miscellaneous (China Telecom)

**WID/SID:** NR\_RF\_FR1-Core, NR\_RF\_FR2\_req\_enh

**Document for:** Discussion and Decision

# Introduction

This document is the report of the following email discussion:

* [AT113-e][027][R4 Other] Miscellaneous (China Telecom)

 Scope: [R2-2100025](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100025.zip), [R2-210029](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100029.zip)3, [R2-2101353](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101353.zip), [R2-2101528](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101528.zip)

 Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

 Intended outcome: Report and Agreed CRs if any is agreeable.

 Deadline for providing comments and for rapporteur inputs:

* + - Initial deadline (for companies' feedback and rapporteur's summary): 1st week Thu Jan 28, UTC 1200
		- Deadline for CR finalization: 2nd week Thu Feb 4, UTC 1000

**Contact from companies**

|  |  |
| --- | --- |
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# Discussion

## Max data rate for uplink Tx switching

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| [R2-2100025](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100025.zip) LS on uplink Tx switching (R1-2009676; contact: China Telecom) RAN1 LS in Rel-16 NR\_RF\_FR1 To:RAN2 Cc:RAN4[R2-2100293](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100293.zip) CR for the supported max date rate for uplink Tx switching China Telecommunication, huawei, HiSilicon CR Rel-16 38.306 16.3.0 0483 - F NR\_RF\_FR1-Core |

[R2-2100025](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100025.zip) is an LS from RAN1 on uplink Tx switching. In RAN1#103-e meeting, RAN1 has reached the agreemeet to adopt the TP for max data rate for uplink Tx switching in TS 38.306, Section 4.1.2 and asked RAN2 to take the related agreements into account.

[R2-2100293](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100293.zip) is a CR based on the RAN1 LS for the supported max data rate for uplink Tx switching. The proposed changes in the CR are listed as follows:

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| **< unchanged text omitted>**4.1.2 Supported max data rate for DL/ULFor NR, the approximate data rate for a given number of aggregated carriers in a band or band combination is computed as follows.whereinJ is the number of aggregated component carriers in a band or band combinationRmax = 948/1024For the j-th CC,  is the maximum number of supported layers given by higher layer parameter *maxNumberMIMO-LayersPDSCH* for downlink and maximum of higher layer parameters *maxNumberMIMO-LayersCB-PUSCH* and *maxNumberMIMO-LayersNonCB-PUSCH* for uplink.  is the maximum supported modulation order given by higher layer parameter *supportedModulationOrderDL* for downlink and higher layer parameter *supportedModulationOrderUL* for uplink. is the scaling factor given by higher layer parameter *scalingFactor* and can take the values 1, 0.8, 0.75, and 0.4.  is the numerology (as defined in TS 38.211 [6])  is the average OFDM symbol duration in a subframe for numerology , i.e. . Note that normal cyclic prefix is assumed.  is the maximum RB allocation in bandwidth  with numerology , as defined in 5.3 TS 38.101-1 [2] and 5.3 TS 38.101-2 [3], where  is the UE supported maximum bandwidth in the given band or band combination. is the overhead and takes the following values0.14, for frequency range FR1 for DL0.18, for frequency range FR2 for DL0.08, for frequency range FR1 for UL0.10, for frequency range FR2 for ULNOTE 1: Only one of the UL or SUL carriers (the one with the higher data rate) is counted for a cell operating SUL.NOTE 2:  For UL Tx switching between carriers in cell(s), only the supported MIMO layer combination across carriers that results in the highest combined data rate is counted for the cell(s) in the supported maximum UL data rate.**< unchanged text omitted>** |

**Q1: Do companies have any comment on RAN1’s LS** [**R2-2100025**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100025.zip)**?**

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| **Company** | **Yes/No** | **Comments** |
| China Telecom | No |  |
| Samsung | No |  |
| ZTE | No |  |
| Huawei, HiSilicon | No |  |
| Ericsson | No |  |
| Qualcomm Incorporated | No |  |
| LG | No |  |
| CATT | No |  |
| Nokia | No |  |
| MediaTek | No |  |
| Apple | No |  |

**Q2: Do companies agree with the proposed changes in** [**R2-2100293**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100293.zip)**?**

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| **Company** | **Yes/No** | **Comments** |
| China Telecom | Yes |  |
| Samsung | Yes | Several editorial comments:- In the coversheet, CR number should be added.- In the coversheet, impact analysis should be added.- ‘Tab’ character (not spaces) should be used after ‘NOTE 2:’. |
| ZTE | Yes | Agree with Samsung’s comments.  |
| Huawei, HiSilicon | Yes |  |
| Ericsson |  | We think this is being discussed now again in Ran1, so probably we should wait for the updated Ran1 input.  |
| Qualcomm Incorporated | Yes |  |
| LG | Yes |  |
| Intel | Yes | We understand that there is on-going RAN1 discussion as Ericsson mentioned. However, it seems the change is a bit small i.e. just some clarification in the NOTE. So, RAN2 could agree this CR as baseline and we could update once RAN1 agrees.  |
| CATT | Yes |  |
| Nokia | Yes | Agree with Intel |
| MediaTek | Yes |  |
| Apple | Yes |  |

**Rapporteur summary of Phase 1 discussion:**

The majority of companies (11/12) support the changes in R2-2100293 and some modifications are suggested on the coversheet. Ericsson has the concern that RAN1 is discussing the related issues again and suggests RAN2 wait for the updated RAN1 input. Intel and Nokia suggest RAN2 agree this CR as baseline and update once RAN1 agrees. The rapporteur also agrees with Intel and Nokia. Since this CR is based on the RAN1’s LS and most of the companies support the changes, RAN2 could agree it as baseline and update if RAN1 has further input.

Based on the above discussion, the rapporteur proposes that RAN2 agrees the changes in R2-2100293 with necessary modifications on the coversheet.

**Phase 2:**

Companies can check the draft revision of R2-2100293.

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| **Company** | **Comments** |
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During the Phase2 discussion, companies point out that RAN1 discusses the related issue again and agrees to modify the previous note to be added in TS 38.306, clause 4.1.2. RAN1 also approves an LS [R1-2102058] in RAN1#104e meeting to inform RAN2 about the updates. The content of RAN1 LS is as follows:

Agreement:

* Adopt the following TP (38.306, Section 4.1.2).

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| **< unchanged text omitted>**4.1.2 Supported max data rateFor NR, the approximate data rate for a given number of aggregated carriers in a band or band combination is computed as follows.whereinJ is the number of aggregated component carriers in a band or band combinationRmax = 948/1024For the j-th CC,  is the maximum number of supported layers given by higher layer parameter *maxNumberMIMO-LayersPDSCH* for downlink and maximum of higher layer parameters *maxNumberMIMO-LayersCB-PUSCH* and *maxNumberMIMO-LayersNonCB-PUSCH* for uplink.  is the maximum supported modulation order given by higher layer parameter *supportedModulationOrderDL* for downlink and higher layer parameter *supportedModulationOrderUL* for uplink. is the scaling factor given by higher layer parameter *scalingFactor* and can take the values 1, 0.8, 0.75, and 0.4.  is the numerology (as defined in TS 38.211 [6])  is the average OFDM symbol duration in a subframe for numerology , i.e. . Note that normal cyclic prefix is assumed.  is the maximum RB allocation in bandwidth  with numerology , as defined in 5.3 TS 38.101-1 [2] and 5.3 TS 38.101-2 [3], where  is the UE supported maximum bandwidth in the given band or band combination. is the overhead and takes the following values0.14, for frequency range FR1 for DL0.18, for frequency range FR2 for DL0.08, for frequency range FR1 for UL0.10, for frequency range FR2 for ULNOTE 1: Only one of the UL or SUL carriers (the one with the higher data rate) is counted for a cell operating SUL.NOTE 2:  For UL Tx switching between carriers, only the supported MIMO layer combination across carriers that results in the highest combined data rate is counted for the carriers in the supported maximum UL data rate.**< unchanged text omitted>** |

Since the agreement from RAN1 was not significantly different than the previous one, it was mainly the change of the terminology. So companies suggest RAN2 update the CR based on the updated RAN1 LS.

Based on the above discussion, the rapporteur proposes that

**Proposal 1: R2-2100293 is revised according to the RAN1 LS [R1-2102058] and with necessary modifications on the coversheet in R2-2102301. R2-2102301 is agreed.**

## MPE

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| [R2-2101353](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101353.zip) Clarification on the MPE-prohibit timer Apple, Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.3.0 1029 - F NR\_RF\_FR2\_req\_enh[R2-2101528](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101528.zip) Correction to 38.321 on MPE P-MPR Report ZTE Corporation, Sanechips CR Rel-16 38.321 16.3.0 1042 - F NR\_RF\_FR2\_req\_enh |

Both of the above CRs are focused on the correction to MPE related issues in TS 38.321.

[R2-2101353](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101353.zip) clarifies that MPE-prohibit timer should be applicable for both the absolutive threshold and the relative threshold based MPE trigger.

[R2-2101528](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101528.zip) also raises the issue that“MEP P-MPR report” shall apply to the relative change based MPE reporting as well as absolute based MPE reporting. Besides that, some other changes related to MPE report are proposed including the following contents:

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| 1: Make the terminology ‘MPE P-MPR report’ apply to relative change MPE reporting3: Restrict the relative MPE P-MPR reporting with the FR2 serving cell only 2: Remove the redundant sentence ‘start or restart phr-PeriodicTimer’ from the text procedure. |

**Q3: Do companies agree with the proposed changes in** [**R2-2101353**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101353.zip) **and** [**R2-2101528**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101528.zip)**?**

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| **Company** | **Yes/No** | **Comments** |
| China Telecom | Yes | The corrections on MPE report are reasonable and can make the spec clear. For the clarification on the MPE-prohibit timer applicable for both the absolute threshold and the relative threshold based MPE trigger, we slightly prefer the changes in R2-2101353, which seems easier to understand. We could further discuss the detail wording and merge them into one agreeable CR. |
| Samsung | Yes | In general, we agree with the intention of the changes in two CRs, but the text can be improved/simplified like below? (maybe this was discussed before, and if so, we are also fine to go with R2-2101353)

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| …- if *mpe-Reporting-FR2* is configured, and *mpe-ProhibitTimer* is not running- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] is equal to or larger than *mpe-Threshold* for at least one activated FR2 Serving Cell since the last transmission of a PHR in this MAC entity; or- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] for at least one activated FR2 Serving Cell having changed more than *phr-Tx-PowerFactorChange* dB since the last transmission of a PHR in this MAC entity.In which case the PHR is referred below to as ‘MPE P-MPR report’.NOTE 2: The MAC entity should avoid triggering a PHR when the required power backoff due to power management decreases only temporarily (e.g. for up to a few tens of milliseconds) and it should avoid reflecting such temporary decrease in the values of PCMAX,f,c/PH when a PHR is triggered by other triggering conditions.NOTE 3: If a HARQ process is configured with *cg-RetransmissionTimer* and if the PHR is already included in a MAC PDU for transmission by this HARQ process, but not yet transmitted by lower layers, it is up to UE implementation how to handle the PHR content.… |

In addition, the last change in R2-2101528 (about redundant) is incorrect (I guess they confused between periodic and prohibit) |
| ZTE(Fei) | Yes | We agree with Samsung’s suggestion for the simplicity, and sorry for the incorrect last change from our CR. |
| Huawei, HiSilicon | Yes | We also think the change is better to be kept simple. |
| Ericsson | Yes | Samsung’s proposal is acceptable. |
| Qualcomm Incorporated | Yes | But the last change in R2-2101528. It removed the phr-**Prohibit**Timer, as opposed to phr-**Periodic**Timer. |
| LG | Yes | For MPE-prohibit timer, we think the change in R2-2101353 is easier to understand.Regarding R2-2101528, the current text to trigger the relative change based MPE reporting is clear and no change is needed.  |
| Intel | Yes with comments | We agree with the intention of two CRs. Instead of “and mpe-ProhibitTimer expires or has expired”, “mpe-ProhibitTimer is not running” is more preferred. Samsung’s suggestion seems more readable but don’t have strong view as previously we discussed to merge them and there was no consensus. But indeed, the current structure is not so clean. Regarding removing phr-ProhibitTimer or phr-PeriodicTimer, we are not sure why any of them should be removed. Definitely, phr-ProhibitTimer should be kept. Phr-PeriodicTimer is also restarted if we assume the same behaivor as in LTE PHR reporting i.e. periodic timer is reset when the UE actually sends PHR MAC CE.  |
| CATT | Yes | We agree with the intention of the two CRs, and we prefer “*mpe-ProhibitTimer* is not running” instead of “*mpe-ProhibitTimer* expires or has expired”.  |
| Nokia | Yes | [Proponent] MPE-prohibit timer is to control the MPE reporting interval and should be applicable for both the absolutive threshold and the relative threshold based MPE trigger but current specification description did not take this timer into account. |
| MediaTek | Yes | We agree with the intention of the two CRs. And we think Samsung is proposal is fine. |
| Apple | Yes | ProponentSamsung’s suggestion is also fine to us.  |

**Rapporteur summary of Phase 1 discussion:**

All of the 12 companies agree with the intention of the two CRs and have the consensus to make the spec simple and clear.

For the last change in R2-2101528 (about redundant), it is incorrect and not needed.

For the other changes, Samsung has given a text proposal and many companies are fine with it. The rapporteur also thinks Samsung’s suggestion is more clear and easy to understand.

The rapporteur proposes to merge the two CRs and agree the text proposal from Samsung as baseline. In order to align with the description of the bullet for absolute threshold based MPE trigger, the rapporteur suggests change the bullet for relative threshold based MPE trigger into “the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] has changed more than *phr-Tx-PowerFactorChange* dB for at least one activated FR2 Serving Cell since the last transmission of a PHR in this MAC entity. ”

During the email discussion, LG points out that the relative MPE P-MPR reporting can be triggered based on the absolute MPE P-MPR reporting in the original text, which is removed in the Samsung’s proposed text. The rapporteur and many other companies support LG’s suggestion by adding “due to the measured P-MPR applied to meet MPE requirements being equal to or larger than *mpe-Threshold*” to the proposed text.

Based on the above discussion, the rapporteur proposes that

**Proposal 2: Merge the two CRs and agree the text proposal below as baseline of the draft CR for MPE.**

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| …- if *mpe-Reporting-FR2* is configured, and *mpe-ProhibitTimer* is not running:- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] is equal to or larger than *mpe-Threshold* for at least one activated FR2 Serving Cell since the last transmission of a PHR in this MAC entity; or- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] has changed more than *phr-Tx-PowerFactorChange* dB for at least one activated FR2 Serving Cell since the last transmission of a PHR due to the measured P-MPR applied to meet MPE requirements being equal to or larger than *mpe-Threshold* in this MAC entity.In which case the PHR is referred below to as ‘MPE P-MPR report’.NOTE 2: The MAC entity should avoid triggering a PHR when the required power backoff due to power management decreases only temporarily (e.g. for up to a few tens of milliseconds) and it should avoid reflecting such temporary decrease in the values of PCMAX,f,c/PH when a PHR is triggered by other triggering conditions.NOTE 3: If a HARQ process is configured with *cg-RetransmissionTimer* and if the PHR is already included in a MAC PDU for transmission by this HARQ process, but not yet transmitted by lower layers, it is up to UE implementation how to handle the PHR content.… |

**Phase 2:**

Companies can continue to discuss the detail wording of the draft merged CR for MPE.

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| **Company** | **Comments** |
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**Rapporteur summary of Phase 2 discussion:**

No more comment is received in phase2.

Therefore, the rapporteur proposes to agree the merged CR R2-2102302 for MPE.

**Proposal 2.1: Merge R2-2101353 into R2-2102302.**

**Proposal 2.2: Merge R2-2101528 into R2-2102302.**

**Proposal 2.3: R2-2102302 is agreed with the changes in Proposal 2.**

# Conclusion

Based on the above discussion, the rapporteur proposes that

**Proposal 1: R2-2100293 is revised according to the RAN1 LS [R1-2102058] and with necessary modifications on the coversheet in R2-2102301. R2-2102301 is agreed.**

**Proposal 2: Merge the two CRs and agree the text proposal below as baseline of the draft CR for MPE.**

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| …- if *mpe-Reporting-FR2* is configured, and *mpe-ProhibitTimer* is not running:- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] is equal to or larger than *mpe-Threshold* for at least one activated FR2 Serving Cell since the last transmission of a PHR in this MAC entity; or- the measured P-MPR applied to meet FR2 MPE requirements as specified in TS 38.101-2 [15] has changed more than *phr-Tx-PowerFactorChange* dB for at least one activated FR2 Serving Cell since the last transmission of a PHR due to the measured P-MPR applied to meet MPE requirements being equal to or larger than *mpe-Threshold* in this MAC entity.In which case the PHR is referred below to as ‘MPE P-MPR report’.NOTE 2: The MAC entity should avoid triggering a PHR when the required power backoff due to power management decreases only temporarily (e.g. for up to a few tens of milliseconds) and it should avoid reflecting such temporary decrease in the values of PCMAX,f,c/PH when a PHR is triggered by other triggering conditions.NOTE 3: If a HARQ process is configured with *cg-RetransmissionTimer* and if the PHR is already included in a MAC PDU for transmission by this HARQ process, but not yet transmitted by lower layers, it is up to UE implementation how to handle the PHR content.… |

**Proposal 2.1: Merge R2-2101353 into R2-2102302.**

**Proposal 2.2: Merge R2-2101528 into R2-2102302.**

**Proposal 2.3: R2-2102302 is agreed with the changes in Proposal 2.**

# Reference

1. [R2-2100025](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100025.zip) LS on uplink Tx switching (R1-2009676; contact: China Telecom) RAN1 LS in Rel-16 NR\_RF\_FR1 To:RAN2 Cc:RAN4
2. [R2-2100293](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100293.zip) CR for the supported max date rate for uplink Tx switching China Telecommunication, huawei, HiSilicon CR Rel-16 38.306 16.3.0 0483 - F NR\_RF\_FR1-Core
3. [R2-2101353](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101353.zip) Clarification on the MPE-prohibit timer Apple, Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.3.0 1029 - F NR\_RF\_FR2\_req\_enh
4. [R2-2101528](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101528.zip) Correction to 38.321 on MPE P-MPR Report ZTE Corporation, Sanechips CR Rel-16 38.321 16.3.0 1042 - F NR\_RF\_FR2\_req\_enh
5. [R1-2102058](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_104-e/Inbox/R1-2102058.zip) LS on uplink Tx switching