3GPP TSG-RAN WG2 Meeting #112-e [R2-200xxxx](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-200xxxx.zip)

Elbonia, 2 – 13 November 2020

**Agenda item: 6.15**

**Source: Nokia (discussion moderator)**

**Title: Summary of [AT112-e][022][R4 NR16] MPE (Nokia)**

**Document for: Discussion and Decision**

# 1 Brief scope of the contributions

This document contains the summary of documents from agenda item 6.15 (“NR Other R4 WIs”) as per below excerpt from the session chair minutes:

* [AT112-e][022][R4 NR16] MPE (Nokia)

Treat [R2-2009690](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009690.zip), [R2-2008910](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2008910.zip), [R2-2009164](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009164.zip), [R2-2009906](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip), [R2-2010289](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip), [R2-2009166](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009166.zip), [R2-2010515](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010515.zip), [R2-2009165](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip), [R2-2010516](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip)

Intended outcome: Intermediate: Determine agreeable parts. Final: For agreeable parts, agreed CRs.

Deadline: Intermediate deadline(s) by Rapporteur, Final: Discussion stop at Wed Nov 11, 1200 UTC

The contributions belonging to this discussion are listed below.

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| **MPE**  *MAC*  [R2-2009690](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009690.zip) Miscellaneous correction on MPE reporting to 38.321 LG Electronics Inc., Ericsson, Apple CR Rel-16 38.321 16.2.1 0936 - F NR\_RF\_FR2\_req\_enh  [R2-2008910](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2008910.zip) Correction of MPE reporting field name Lenovo, Motorola Mobility CR Rel-16 38.321 16.2.1 0900 - F NR\_RF\_FR2\_req\_enh  [R2-2009164](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009164.zip) Corrections to MPE reporting Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.2.1 0909 - F NR\_RF\_FR2\_req\_enh  *MAC - relative threshold trigger*  [R2-2009906](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip) 38.321 Correction on MPE reporting triggered by the relative threshold ZTE Corporation, Sanechips CR Rel-16 38.321 16.2.1 0949 - F NR\_RF\_FR2\_req\_enh  [R2-2010289](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip) 38.331 Correction on relative threshold for MPE configuration ZTE Corporation, Sanechips CR Rel-16 38.331 16.2.0 2200 - F NR\_RF\_FR2\_req\_enh  *Stage 2*  [R2-2009166](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009166.zip) Stage-2 description of MPE reporting Nokia (Rapporteur) CR Rel-16 38.300 16.3.0 0299 - F NR\_RF\_FR2\_req\_enh  [R2-2010515](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010515.zip) Introduction of MPE reporting Ericsson CR Rel-16 38.300 16.3.0 0319 - F NR\_RF\_FR2\_req\_enh  [R2-2010981](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010981.zip) Stage-2 description of MPE reporting Nokia (Rapporteur), Ericsson CR Rel-16 38.300 16.3.0 0299 1 F NR\_RF\_FR2\_req\_enh Late  *Dual Connectivity and Handover*  [R2-2009165](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip) Corrections to inter-node signalling for MPE reporting Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.2.0 2037 - F NR\_RF\_FR2\_req\_enh  [R2-2010516](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip) MPE for EN-DC, NE-DC, NR-DC and DAPS Ericsson discussion |

These are divided into four main categories: General MAC corrections, relative reporting corrections, Stage-2 description and MPE for DC/HO. Each of these will be handled separately in the next chapter.

# 2 MPE discussion topics

## 2.1 General MAC corrections

The general MAC corrections have both overlap and separate topics, making it difficult to categorize the changes exactly. It seems sensible to first attempt to see which changes are agreeable, and then attempt to merge all these changes to a consolidated CRs. As a first step, the discussion will attempt to collect issues with each of the proposed CRs to see which parts could be generally agreeable.

**Question 1a: Do you agree with the content of the** [**R2-2009690**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009690.zip)**?**

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| **Contribution:** [**R2-2009690**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009690.zip) *Miscellaneous correction on MPE reporting to 38.321 LG Electronics Inc., Ericsson, Apple CR Rel-16 38.321 16.2.1 0936 - F NR\_RF\_FR2\_req\_enh* | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 1. Company comments to** [**R2-2009690**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009690.zip)

**Intermediate conclusions to Q1a: TBA**

**Question 1b: Do you agree with the content of the** [**R2-2009164**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009164.zip)**?**

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| **Contribution:** [**R2-2009164**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009164.zip) *Corrections to MPE reporting Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.2.1 0909 - F NR\_RF\_FR2\_req\_enh* | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 2. Company comments to** [**R2-2009164**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009164.zip)

**Intermediate conclusions to Q1b: TBA**

**Question 1c: Do you agree with the content of the** [**R2-2008910**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2008910.zip)**?**

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| **Contribution:** [**R2-2008910**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2008910.zip) *Correction of MPE reporting field name Lenovo, Motorola Mobility CR Rel-16 38.321 16.2.1 0900 - F NR\_RF\_FR2\_req\_enh* | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 3. Company comments to** [**R2-2008910**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2008910.zip)

**Intermediate conclusions to Q1c: TBA**

## 2.2 MPE relative threshold triggering

The contributions in [R2-2009906](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip) and [R2-2010289](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip) both concern the same topic: How the relative MPE reporting is defined and triggered. Companies are requested to provide comments for both of these.

**Question 2a: Do you agree with the content of the** [**R2-2009906**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip)**?**

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| **Contribution:** [**R2-2009906**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip) *38.321 Correction on MPE reporting triggered by the relative threshold ZTE Corporation, Sanechips CR Rel-16 38.321 16.2.1 0949 - F NR\_RF\_FR2\_req\_enh* | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 4. Company comments to** [**R2-2009906**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip)

**Intermediate conclusions to Q2a: TBA**

**Question 2b: Do you agree with the content of the** [**R2-2010289**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip)**?**

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| **Contribution:** [**R2-2010289**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip) *38.331 Correction on relative threshold for MPE configuration ZTE Corporation, Sanechips CR Rel-16 38.331 16.2.0 2200 - F NR\_RF\_FR2\_req\_enh* | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 5. Company comments to** [**R2-2010289**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip)

**Intermediate conclusions to Q2b: TBA**

## 2.3 MPE Stage-2 description

There were originally two contributions with Stage-2 descriptions provided, but they have been combined into one input co-signed by both original contributors. Therefore it makes sense to only consider the latest input in this discussion.

**Question 3: Do you agree with the content of the** [**R2-2010981**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010981.zip)**?**

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| **Contribution:** [**R2-2010981**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010981.zip) *Stage-2 description of MPE reporting Nokia (Rapporteur), Ericsson* | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** | |
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**Table 6. Company comments to** [**R2-2010981**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010981.zip)

**Intermediate conclusions to Q3: TBA**

## 2.4 MPE impacts to DC and handover

The documents under this sub-topic concern the following questions:

* During handover, should source node indicate the MPE status of FR2 serving cells received from UE to the target node?
* Is MPE reporting supported for (some) MR-DC architecture options? If yes, to which extent, e.g. should LTE MAC support MPE reporting?
* Is MPE supported during DAPS handover?

**Handover**: The first part of the CR [**R2-2009165**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip) proposes that inter-node signalling should indicate UE-reported MPE status of FR2 serving cells. This was not truly discussed before, but RAN2 often defines such inter-node signalling rather late.

**Question 4a: Should reported MPE results of FR2 serving cells be conveyed from source cell to target cell during handover? (**[**R2-2009165**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip)**)**

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| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 7. Company comments to** [**R2-2009165**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip)**: MPE indication in inter-node messages**

**Intermediate conclusions to Q4: TBA**

**NR-DC**: The second part of [**R2-2009165**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip) and the proposal 5 of [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip) are NR-DC support of MPE reporting, so these questions are considered jointly. The main questions are two-fold:

1. Should MN/SN convey MPE information to each other when MPE reporting is configured (as MN/SN may not know whether MPE reporting is configured in the other MAC entity)? ([**R2-2009165**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip))
2. Should UE with NR-DC indicate MPE status for MN/SN/all FR2 serving cells when configured with MPE reporting? (Proposal 5 from [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip))

**Question 5a: Should MN/SN convey MPE information to each other when MPE reporting is configured (as MN/SN may not know whether MPE reporting is configured in the other MAC entity)?**

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| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 10. Company comments to MN/SN MPE inter-node signalling in NR-DC as per** [**R2-2009165**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip)

**Intermediate conclusions to Q5a: TBA**

**Question 5b: Should UE with NR-DC indicate MPE status for MN/SN/all serving cells when configured with MPE reporting? (Proposal 5 from** [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip)**)?**

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| **Proposal 5 In NR-DC, if MPE is configured for a MAC entity, that MAC entity shall report MPE for all serving cells (also the cells of the other MAC entity).** | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 10. Company comments to NR-DC and DAPS proposals of** [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip)

**Intermediate conclusions to Q5b: TBA**

**LTE MAC support**: The remainder of [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip) discussed multiple proposals on various topics related to MR-DC support of MPE. The main question in the contribution seems to be whether MPE reporting should be supported towards LTE cells or only to NR FR2 cells, which has obvious consequences for MR-DC cases. The proposals 1-4 essentially propose that MPE reporting is only supported towards NR and no modifications should be done to LTE MAC to enable MPE reporting, as shown below:

**Proposal 1 RAN2 confirms that MPE reporting for SCG-cells to the MN is not supported in EN-DC.**

**Proposal 2 MPE reporting is supported for EN-DC, but UE only reports MPE for the SCG FR2-cells towards the SN (not the MN).**

**Proposal 3 RAN2 confirms that MPE reporting for MCG-cells to the SN is not supported in NE-DC.**

**Proposal 4 MPE reporting to is supported for NE-DC, but UE only reports MPE for the MN FR2-cells towards the MN (not the SN).**

**Question 6: Should MPE reporting be supported for LTE MAC?**

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| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 8. Company comments to LTE support of MPE signalling (proposals 1-4 of** [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip)**)**

**Intermediate conclusions to Q6: TBA**

**DAPS and MPE**: The remaining question is about support of MPE during DAPS: When DAPS is being executed and MCG MAC entity is configured for MPE reporting, does UE report MPE for both source and target PCell (since neither MR-DC nor SCells are not supported during DAPS handover in Rel-16)?

**Question 7: Do you agree with the proposal 6 of** [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip)**?**

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| **Proposal 6 In DAPS, if MPE is configured for a MAC entity, that MAC entity shall report MPE for all serving cells (also the cell of the other MAC entity).** | | |
| **Company** | **Agree (Yes/No/Partly)** | **Comments** |
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**Table 10. Company comments to NR-DC and DAPS proposals of** [**R2-2010516**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip)

**Intermediate conclusions to Q7: TBA**

# 3 Conclusions

**TBA**

# 4 List of referenced documents

[1] [R2-2009690](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009690.zip) Miscellaneous correction on MPE reporting to 38.321 LG Electronics Inc., Ericsson, Apple CR Rel-16 38.321 16.2.1 0936 - F NR\_RF\_FR2\_req\_enh

[2] [R2-2008910](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2008910.zip) Correction of MPE reporting field name Lenovo, Motorola Mobility CR Rel-16 38.321 16.2.1 0900 - F NR\_RF\_FR2\_req\_enh

[3] [R2-2009164](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009164.zip) Corrections to MPE reporting Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.2.1 0909 - F NR\_RF\_FR2\_req\_enh

[4] [R2-2009906](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009906.zip) 38.321 Correction on MPE reporting triggered by the relative threshold ZTE Corporation, Sanechips CR Rel-16 38.321 16.2.1 0949 - F NR\_RF\_FR2\_req\_enh

[5] [R2-2010289](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010289.zip) 38.331 Correction on relative threshold for MPE configuration ZTE Corporation, Sanechips CR Rel-16 38.331 16.2.0 2200 - F NR\_RF\_FR2\_req\_enh

[6] [R2-2009166](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009166.zip) Stage-2 description of MPE reporting Nokia (Rapporteur) CR Rel-16 38.300 16.3.0 0299 - F NR\_RF\_FR2\_req\_enh

[7] [R2-2010515](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010515.zip) Introduction of MPE reporting Ericsson CR Rel-16 38.300 16.3.0 0319 - F NR\_RF\_FR2\_req\_enh

[8] [R2-2010981](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010981.zip) Stage-2 description of MPE reporting Nokia (Rapporteur), Ericsson CR Rel-16 38.300 16.3.0 0299 1 F NR\_RF\_FR2\_req\_enh Late

[9] [R2-2009165](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2009165.zip) Corrections to inter-node signalling for MPE reporting Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.2.0 2037 - F NR\_RF\_FR2\_req\_enh

[10] [R2-2010516](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_112-e/Docs/R2-2010516.zip) MPE for EN-DC, NE-DC, NR-DC and DAPS Ericsson discussion