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## 1 Introduction

An LS was received from RAN2 asking questions on initial state of elements controlled by MAC CEs [R1-2110756]. This thread is to collect views from companies and formulate a response to RAN2.

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## 2 Views and Comments

**Question 1:** Firstly, since a handover only refers to PCell change, RAN2 respectfully asks RAN1 to clarify whether the initial deactivation when using handover should be applied for both PCell change and PSCell change/addition in case of DC.

### Feedback Form 1: Views and comments on Question 1

<p><b>1 – HUAWEI TECHNOLOGIES Co. Ltd.</b></p> <p>In the case of DC, as PSCell change/addition is similar to handover on the SCG, the initial state of deactivation should be assumed.</p>
<p><b>2 – vivo Mobile Communication Co.</b></p> <p>The initial deactivation is applicable for both PCell change and PSCell change/addition in case of DC.</p>
<p><b>3 – Samsung Electronics Co.</b></p> <p>Not only PCell change, but also PSCell change/addition in case of DC should be considered for the initial deactivation.</p>
<p><b>4 – Ericsson-LG Co.</b></p> <p>Initial deactivation should be applied for both PCell change and PSCell change/addition in case of DC.</p>
<p><b>5 – ZTE Corporation</b></p> <p>The initial deactivation when using handover should be applied for both PCell change and PSCell change/addition in case of DC since the PSCell change/addition is also operated by RRC configuration from RAN1 perspective</p>
<p><b>6 – CATT</b></p> <p>The initial deactivation should be applied for both PCell change and PSCell change/addition.</p>
<p><b>7 – Intel Corporation (UK) Ltd</b></p> <p>We agree that handover should be applied for both PCell change and PSCell change/addition in case of DC</p>

**8 – Qualcomm communications-France**

Yes, the initial deactivation when using handover should be applied for both PCell change and PSCell change/addition.

**Question 2:** Secondly, RAN2 respectfully asks RAN1 to clarify whether the initial deactivation when using configuration should be applied for both “initial configuration by RRC” and “reconfiguration by RRC”.

**Feedback Form 2: Views and comments on Question 2**

**1 – HUAWEI TECHNOLOGIES Co. Ltd.**

The initial state of deactivation is applied for “initial configuration by RRC”. For “reconfiguration by RRC” excluding the handover case, as long as the corresponding elements are NOT impacted by the reconfiguration message, they should maintain their previous state; and for elements newly added or modified by the reconfiguration message, initial state of deactivation is applied.

**2 – vivo Mobile Communication Co.**

The initial deactivation when using *configuration* should be interpreted that it is applied for both “initial configuration by RRC” and “reconfiguration by RRC”

**3 – Samsung Electronics Co.**

The initial deactivation should be also applied when using *configuration* if related RRC parameters are changed by reconfiguration.

**4 – Ericsson-LG Co.**

Initial deactivation should be applied for both ‘initial configuration by RRC’ and ‘reconfiguration by RRC’.

**5 – ZTE Corporation**

The initial deactivation when using configuration should be applied for both “initial configuration by RRC” and “reconfiguration by RRC” since there is no difference between them from RAN1 perspective.

**6 – CATT**

**The initial deactivation should be applied to both cases.**

**7 – Intel Corporation (UK) Ltd**

We have slight preference NOT to specify that “configuration” also covers “RRC reconfiguration”

**8 – Qualcomm communications-France**

The initial deactivation when using configuration should be applied for “initial configuration by RRC”. It should be also applied for “reconfiguration by RRC” only if the reconfiguration involves radio resources. Reconfiguration of other parameters does not need to trigger deactivation.

**Question 3:** Thirdly, RAN2 respectfully asks RAN1 to clarify whether the UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE should be aligned with the other MAC CEs.

### Feedback Form 3: Views and comments on Question 3

<p><b>1 – HUAWEI TECHNOLOGIES Co. Ltd.</b></p> <p>This MAC-CE is used for activating one spatial relation for one or multiple PUCCH resource(s), and initial state of deactivation is applied for configured candidate spatial relations.</p>
<p><b>2 – vivo Mobile Communication Co.</b></p> <p>The UE behavior relevant to (Enhanced) PUCCH spatial relation initial deactivation MAC CE should also be aligned with other MAC CEs. For other activation behavior, RAN2 should further clarify the intention.</p>
<p><b>3 – Samsung Electronics Co.</b></p> <p>We think that there is no difference between (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE and other MAC CEs.</p>
<p><b>4 – Ericsson-LG Co.</b></p> <p>The UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE should be aligned with the other MAC CEs.</p>
<p><b>5 – ZTE Corporation</b></p> <p>UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE should be aligned with the other MAC CEs.</p>
<p><b>6 – CATT</b></p> <p><b>Spatial relation info for (Enhanced) PUCCH are configured by RRC and then activated by the MAC CE. It has similar activation mechanism to that of CSI-RS/SRS or CSI reporting. Therefore, the UE behavior should be aligned with other MAC CEs.</b></p>
<p><b>7 – Intel Corporation (UK) Ltd</b></p> <p>Aligning this MAC with other MAC CEs would be new behavior and there is potential NBC risk. We ask proponents to clarify NBC aspect for this change.</p>
<p><b>8 – Qualcomm communications-France</b></p> <p>Yes, the UE behaviour relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE should be aligned with the other MAC CEs.</p>

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## 3 Summary of initial round

**Question 1:** All participating companies agree that initial state of deactivation is applied for both PCell change and PSCell change/addition in the case of DC.

**Question 2:** All participating companies agree that initial state of deactivation is applied for “initial configuration by RRC”. It is pointed out by several companies that initial state of deactivation is applied for “reconfiguration by RRC” with PCell change and PSCell change/addition in the case of DC (see Question 1) or when the corresponding elements are impacted by the reconfiguration message (unimpacted elements

should maintain their previous state).

**Question 3:** Most participating companies agree that the UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE should be aligned with other MAC CEs, i.e., initial state of deactivation is applied for configured candidate spatial relations. One company mentioned there may be potential risk of non-backward compatible (NBC), and asked the proponents to clarify.

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## 4 Views and Comments - 2nd

**Draft Answer 1:** Initial state of deactivation is applied for both PCell change and PSCell change/addition in the case of DC.

### Feedback Form 4: Views on Draft Answer 1

<b>1 – HUAWEI TECHNOLOGIES Co. Ltd.</b> Yes
<b>2 – Samsung Electronics Co.</b> We are fine with this draft answer 1.
<b>3 – CATT</b> Yes
<b>4 – Ericsson-LG Co.</b> Support
<b>5 – vivo Mobile Communication Co.</b> Support
<b>6 – ZTE Corporation</b> Support

**Draft Answer 2:** Initial state of deactivation is applied for “initial configuration by RRC”, and is applied for “reconfiguration by RRC” with PCell change and PSCell change/addition in the case of DC or when the corresponding elements are impacted by the reconfiguration message (unimpacted elements should maintain their previous state).

### Feedback Form 5: Views on Draft Answer 2

<b>1 – HUAWEI TECHNOLOGIES Co. Ltd.</b> Yes
<b>2 – Samsung Electronics Co.</b> We are fine with this draft answer 2.

### 3 – CATT

Yes

### 4 – vivo Mobile Communication Co.

Not sure about the condition ” when the corresponding elements are impacted by the reconfiguration message (unimpacted elements should maintain their previous state)”. Our understanding is that previous state remain effective before the next MAC CE indication starts their effectiveness irrespective any conditions.

### 5 – vivo Mobile Communication Co.

Further comment based on some offline:

With the latest wording, we would like to clarify what is the understanding with ”when the corresponding elements are impacted by the reconfiguration message (unimpacted elements should maintain their previous state)”. For example when there is PDSCH TCI state pool reconfiguration, before activation of the 8 TCI states, it should not be assumed that previous PDSCH TCI state are deactivated by the reconfiguration message otherwise the connection between the UE and the network would be lost.

Thus we would like to revise as following

Initial state of deactivation is applied for “initial configuration by RRC”, and is applied for “reconfiguration by RRC” with PCell change and PSCell change/addition in the case of DC or when the corresponding elements are impacted by the reconfiguration message (~~unimpacted elements should maintain their previous state~~). The activated/deactivated status of previously configured/activated semi-persistent CSI-RS/CSI-IM resource sets, TCI states for PDSCH, Semi-persistent CSI reporting on PUCCH, Semi-persistent SRS resource sets, Semi-persistent ZP CSI-RS resource sets, Semi-persistent Positioning SRS and (Enhanced) PUCCH spatial relation remains unaffected by reconfiguration by RRC message.

### 6 – Ericsson-LG Co.

We slightly prefer the version from the moderator.

### 7 – ZTE Corporation

Just to align our understanding on the sentence of ‘when the corresponding elements are impacted by the reconfiguration message’. Does it mean the related RRC configuration is changed after reconfiguration or there are related RRC parameters in the reconfiguration message. It should be noted, even though there are related RRC parameters in the reconfiguration message, the related configuration may not be changed by RRC. We guess it should be the former one, right?

In this case, the UE should compare the RRC configuration before and after reconfiguration. If the UE finds the related RRC configuration is changed, the initial state of deactivation is applied. Otherwise, the previous activation/deactivation state maintains.

### 8 – vivo Mobile Communication Co.

We would like to check the group’s understanding on the following example:

When there is PDSCH TCI state pool reconfiguration, before activation of the 8 TCI states, which one of the following should be assumed?

- Option 1. it should be assumed that all the previously activated PDSCH TCI state are deactivated due to the reconfiguration message change the TCI state pool;

- Option 2. it should be assumed that all the previously activated PDSCH TCI state are still activated before next MAC CE indication.
- Option 3. it should be assumed that some of the previously activated PDSCH TCI state are activated and some are not. This depends on whether the TCI state pool reconfiguration change the TCI state or not.

Our understanding is Option2.

**Draft Answer 3:** The UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE should be aligned with other MAC CEs, i.e., initial state of deactivation is applied for configured candidate spatial relations.

Moderator’s note: If a risk of being non-backward compatible is identified, please indicate in the table below.

**Feedback Form 6: Views on Draft Answer 3**

<p><b>1 – HUAWEI TECHNOLOGIES Co. Ltd.</b></p> <p>Yes</p>
<p><b>2 – Samsung Electronics Co.</b></p> <p>We are fine with this draft answer 3.</p>
<p><b>3 – CATT</b></p> <p>Yes</p>
<p><b>4 – Ericsson-LG Co.</b></p> <p>Support</p>
<p><b>5 – vivo Mobile Communication Co.</b></p> <p>Support</p>
<p><b>6 – Intel Corporation (UK) Ltd</b></p> <p>As we commented in the first round, aligning with other MAC CE is NBC change. We should indicate that aspect as part of the response and ask RAN2 to address this issue if they decide to align with other MAC CEs.</p>
<p><b>7 – HUAWEI TECHNOLOGIES Co. Ltd.</b></p> <p>Moderator: I had some offline discussion with Intel. It is understood that Intel’s view is the fact that RAN1 indicating alignment is needed would imply previously it was not aligned, so it may be considered as a NBC change. In this sense, from moderator perspective, it is perhaps better to reformualte the answer as below. Please check.</p> <p>RAN1 assumed the UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE is aligned with other MAC CEs, i.e., initial state of deactivation is applied for configured candidate spatial relations. So, nothing is to be aligned from RAN1 perspective.</p>

## 8 – ZTE Corporation

We share the same view with Intel. There is no description related to initial deactivation state for the (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE in RAN2 spec. Since the updates (if any) should be reflected in RAN2 spec, it may be an NBC change from the spec perspective. So we can add the following clarification in the reply LS to make it more clear. “Whether or not to reflect this in the specification for the (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE is up to RAN2. From RAN1 perspective, either is OK”.

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## 5 Summary of 2nd round

**Summary:** All participating companies are fine with Draft Answer 1.

**Draft Answer 1:** Initial state of deactivation is applied for both PCell change and PSCell change/addition in the case of DC.

**Summary:** vivo and ZTE commented on the condition in Draft Answer 2. The moderator shares the understanding of ZTE and prepared a revised version as below. Regarding the question/revision from vivo, no feedback is received from companies. From the moderator’s perspective, if the QCL reference in a previously activated TCI state has been changed by the reconfiguration message, it seems reasonable to apply initial state of deactivation, with which the revision from vivo may not be needed.

**Draft Answer 2:** Initial state of deactivation is applied for “initial configuration by RRC”, and is applied for “reconfiguration by RRC” with PCell change and PSCell change/addition in the case of DC or when the corresponding elements are newly added or modified by the reconfiguration message (unimpacted elements should maintain their previous state).

**Summary:** Intel commented on possible NBC risk if RAN1 indicating alignment is needed. After checking with Intel, the moderator proposed a revised version for Draft Answer 3, and an addition was suggested by ZTE, as below.

**Draft Answer 3:** RAN1 assumed the UE behavior relevant to (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE is aligned with other MAC CEs, i.e., initial state of deactivation is applied for configured candidate spatial relations. So, nothing is to be aligned from RAN1 perspective. Whether or not to reflect this in the specification for (Enhanced) PUCCH spatial relation Activation/Deactivation MAC CE is up to RAN2. From RAN1 perspective, either is OK.

**Summary:** The moderator proposes to move the discussion to the RAN1 reflector to review/endorse the draft answers to RAN2 listed above.