3GPP TSG-RAN WG2 Meeting #109bis-e [R2-2003841](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-200xxxx.zip)

Elbonia, 20 – 30 April 2020

**Agenda item: 4.5**

**Source: Nokia (RAN2 Vice-chair )**

**Title: Summary and discussion of LTE contributions in AI 4.5**

**Document for: Discussion and Decision**

# 1 Brief scope of the LTE legacy contributions

This document contains the summary of documents from agenda item 4.5 (“Other LTE corrections Rel-15 and earlier”) as referenced in Section 4.

# 2 LTE legacy summary

## 2.1 Pre-Rel-15 topics

The documents in [3-7], [17-23], [8-11] and [14-16] all concern pre-Rel-15 topics as shown below.

|  |  |
| --- | --- |
| **Tdoc(s), Title, Company** | **Proposal(s)** |
| 1) [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip), [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip), [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip), [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip), [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip), “Clarification to UE capabilities for non-contiguous intra-band CA“ Nokia, Nokia Shanghai BellAND[R2-2003548](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip), [R2-2003549](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip), [R2-2003550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip), [R2-2003551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip), [R2-2003552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip), [R2-2003553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip), [R2-2003554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003554.zip), “Clarification on UE capability for intra-band non-continuous CA”, Huawei, Hisilicon | **Discussed already in RAN2#109-e**CRs from Rel-12 to clarify intra-band non-contiguous is handled as intra-band contiguous as proposed by discussion document. |
| 2) [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip), [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip), [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip): “Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs“ Nokia, Nokia Shanghai Bell, Qualcomm Incorporated | **Discussed already in RAN2#109-e**Clarify it is mandatory for UEs to support both CC and DAI for more than 5CCs. |
| 3) [R2-2003451](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip), [R2-2003452](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip), [R2-2003453](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip):”Correction on autonomous measurment gap release”, Huawei, HiSilicon | **New proposal (potentially related to [AT109e][069][NR15])**Clarify which measurement gap configurations are released upon handover and re-establishment |

For the topics 1) and 2), they were already discussed in RAN2#109-e, with the following conclusions (from RAN2#109-e email discussion [203]):

**As per the report of offline discussion [203] in** [**R2-200176:**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-200176%3A.zip)

**For** [**R2-2001134**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001134.zip)**:**

**RAN2 note the following observations on differences of UE capabilities for intra-band contiguous and non-contiguous CA:**

**- Intra-band contiguous CA capabilities are all contained within a single band entry of a band combination, while intra-band non-contiguous CA capabilities require at least two band entries.**

**- For intra-band contiguous carriers, UE band combination capabilities specify that UE supports any ordering of the capabilities.**

**- (Based on TS36.101): The ordering of intra-band non-contiguous entries is relevant for the support of BCS.**

**- (Based on TS36.101): The ordering of BCS is not directly related to the MIMO capabilities.**

**FFS: if UE supports (2, 4) MIMO layers with CA\_xA\_xA, it will also support (4, 2) MIMO layers with CA\_xA\_xA.**

**The CRs in** [**R2-2001135**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001135.zip)**,** [**R2-2001136**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001136.zip)**,** [**R2-2001137**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001137.zip)**,** [**R2-2001138**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001138.zip) **are postponed.**

**The CRs in** [**R2-2001140**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001140.zip)**,** [**R2-2001141**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001141.zip)**,** [**R2-2001142**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001142.zip) **are postponed to next meeting.**

Hence, for this meeting, 1) is about capturing the agreements and 2) continues the discussion that wasn’t concluded, and 3) requires new discussion:

* [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip), [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip), [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip), [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip), [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip) and [R2-2003548](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip), [R2-2003549](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip), [R2-2003550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip), [R2-2003551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip), [R2-2003552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip), [R2-2003553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip), [R2-2003554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003554.zip): Both document sets discuss the same question already discussed last time. Based on teh last meeting’s conclusion, the issues exists but how a correction should be worded and from which release onwards should a correction be made was not decided.
* [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip), [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip), [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip): These CRs attempt to clarify the meaning of “mandatory” for a Rel-13 capability, which requires companies to indicate whether they share the interpretation proposed. This requires (short) discussion on whether the interpretation is correct, whether a CR is needed and from which release.
* [R2-2003451](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip), [R2-2003452](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip), [R2-2003453](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip): The CR attempts to clarify that releasing measurement gap configurations applies to both legacy *MeasGapConfig* as well as *MeasGapConfigPerCC-List* introduced in Rel-14. The correction seems straightforward an inline with existing interpretation.

**DISC S1\_1:** Discuss, based on [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip), [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip), [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip), [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip), [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip) and [R2-2003548](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip), [R2-2003549](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip), [R2-2003550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip), [R2-2003551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip), [R2-2003552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip), [R2-2003553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip), [R2-2003554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003554.zip), what to capture in specifications and from which release onwards.

**DISC S1\_2:** Discuss the CRs [R2-2001140](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001140.zip), [R2-2001141](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001141.zip), [R2-2001142](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2001142.zip) to determine if the interpretation is correct and how a correction should be captured (if needed).

**Proposal S1\_1:** Agree to CRs in [R2-2003451](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip), [R2-2003452](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip), [R2-2003453](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip).

## 2.2 Miscellaneous Rel-15 corrections

The CRs in [1-2], [12-12] and [24-28] all concern Rel-15 as shown below:

|  |  |
| --- | --- |
| **Tdoc, Title, Company** | **Proposal(s)** |
| 4) [R2-2003232](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003232.zip), [R2-2003233](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003233.zip): “Minor changes collected by Rapporteur”, Samsung Telecommunications | **Rapporteur input on ASN.1 naming**When dash (i.e. “-“) is used in ENUMERATED, it denotes a negative value, which is not correct fpor the MBMS SCS case. |
| 5) [R2-2002619](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002619.zip), [R2-2002620](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002620.zip): “Correction on SRB duplication”, OPPO | **New proposal** PDCP specification sub-clause 5.1.2.4 does not contain “SRB” although it was part of an earlier agreed CR from RAN2#102, which may be (mis)interpreted to mean that the procedures in 5.1.2.4 are not applicable for SRB duplication.  |
| 6) [R2-2003569](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003569.zip), [R2-2003570](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003570.zip), [R2-2003571](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003571.zip), [R2-2003572](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003572.zip), [R2-2003573](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003573.zip): “Correction on Need code for CMAS”, Huawei, HiSilicon | **New proposal:**Current need code for CMAS coordinate segment is OR (LTE) or R (NR), which may be interpreted to mean that absence in one message requires UE to drop all previously received segments.  |

Out of these proposals, 4) and 5) seem relatively straightforward to agree so the summary rapporteur proposes to treat them as a batch of agreeable CRs.

**Proposal S2\_1:** Agree to CRs in [R2-2003232](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003232.zip), [R2-2003233](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003233.zip), [R2-2002619](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002619.zip), [R2-2002620](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002620.zip).

For the proposals in 6) , the main issue is related to both LTE and NR, is about general ASN.1 and needs a common understanding for both systems. Therefore, it will be handled in NR joint session

**Proposal S2\_2:** Handle the contributions in [R2-2003569](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003569.zip), [R2-2003570](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003570.zip), [R2-2003571](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003571.zip), [R2-2003572](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003572.zip), [R2-2003573](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003573.zip) main session.

# 3 Company comments to the contributions

## 3.1 Pre-Rel-15 contributions requiring discussion (email discussion [202])

## 3.1.1 [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip), [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip), [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip), [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip), [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip): Clarification to UE capabilities for non-contiguous intra-band CA: (Nokia) and [R2-2003548](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip), [R2-2003549](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip), [R2-2003550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip), [R2-2003551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip), [R2-2003552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip), [R2-2003553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip): Clarification on UE capability for intra-band non-continuous CA (Huawei)

This section deals with DISC\_S1\_1:

***DISC S1\_1:*** *Discuss, based on* [*R2-2003147*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip)*,* [*R2-2003148*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip)*,* [*R2-2003149*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip)*,* [*R2-2003150*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip)*,* [*R2-2003151*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip) *and* [*R2-2003548*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip)*,* [*R2-2003549*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip)*,* [*R2-2003550*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip)*,* [*R2-2003551*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip)*,* [*R2-2003552*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip)*,* [*R2-2003553*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip)*,* [*R2-2003554*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003554.zip)*, what to capture in specifications and from which release onwards.*

Hence, it should be discussed how to capture a clarification and from which release onwards. Companies are requested to provide comments in the tables 1 and 2 below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |
| --- | --- |
| **Company** | **From which release onwards should something be captured and why?** |
|  |  |
| HW | We think changes should be started from Rel-10 in which intra-band non-continuous CA was started to be supported.  |
| Nokia | The problem can only occur from Rel-12 onwards since that's when the per-CC list for intra-band CA band combinations were introduced. Hence, having the note from Rel-12 is necessary  |
|  |  |

**Table 1. Starting release for the correction CRs**

**Conclusions (on CR release): No clear conclusion on which release. Suggest to discuss again once the changes are agreed.**

* **Discuss correction release if/when CR content is agreeed.**

|  |  |
| --- | --- |
| **Company** | **Detailed comments on how to capture a clarification** |
| Ericsson | It seems that Nokia CRs assume all UEs already support the clarification, otherwise a new UE capability is needed?On the Huawei CRsWould be good to clarify what is meant with the “order” – the order in the frequency domain?We are confused on the wording on proposed Note 6a. What is more exactly covered by the wording “sharing the same uplink capability”. Furthermore, cover page talks about also “sharing the same downlink capability”, but this seems not covered by the draft Note6a? |
| HW | We would like to clarify our understanding here. We think the UE capability for intra-band non-continuous CA can be “partial” agnostic to the order. For carriers sharing the same uplink capability, the UE capability can be agnostic to the order. Let us have an example here. If there are in total two carriers e.g., A and B. A can support both UL and DL while B is a DL-only carrier. In this case, when performing carrier aggregation, only carrier A can be allocated as the Pcell while carrier B can only be as Scell. If the reported MIMO layer capability is (2,4) then the NW should not interpret it as (4,2) since this may exceed what the UE actually support which may lead to a drop of the link in the worst case. For another case, if there are 3 carriers aggregated, e.g., A B and C. A and C can support both UL and DL while B is a DL-only carrier, then in this case, the UE capability can be agnostic to the order between A and C. If the reported MIMO layer capability is (2,4,4) then the NW can interpret A supports 2 and C supports 4 or A supports 4 and C supports 2 as A and C have the same uplink capability and there is no need to distinguish between them.  |
| Nokia  | The proposal in Huawei’s CRs introduces a new condition on when the same order of UE capabilities could apply, i.e. “carriers sharing the same uplink capability within intra-band non-contiguous CA”. What does the requirement mean for intra-band non-contiguous CCs? Minor remark: that he CR for legacy release need to respect NOTEs numbering in later releases , NOTE 5 has been superseded in later releases. Therefore, this creates inconsistent CRs.  |
|  |  |
|  |  |

**Table 2. Details of the correction CRs**

**Intermediate conclusion (DISC S1\_1): No clear conclusion, question on UE supports (i..e whether all UEs support the proposed interpretation) was raised but with unclear input (some think “yes”, others think “depends on UL capability”). Propose to continue the discussion on how the current interpretation works without this clarification.**

**Additional question: What is the current interpretation of the specifications concerning DISC\_S1\_1?**

|  |  |
| --- | --- |
| **Company** | **What is the current interpretation of the specification: If UE indicates (4,2) MIMO lauyers for an intra-band non-contiguous band combination, does it also always suppport (2, 4) MIMO layers? If not, please also indicate if is this always the case or only valid for certain cases.** |
| OPPO | Here we take the IE of supportedMIMO-CapabilityDL-r10 as an example (here we try to explain our understanding using 2 sub-block intra-band non-contiguous CA for example):- if the said (4,2) MIMO layer is for a BC of xA\_xA, i.e., 2 (**same**) BW class A sub-blocks at band x (for which the CR mentioned “*intra-band non-contiguous 2DL CA on band* ***A***”, which is a bit unclear to us), then we see no difference if we see the combination as xA(2-layer)\_xA(4-layer) or xA(4-layer)\_xA(2-layer) - if that is the meaning of “For example, UE supporting CA\_xA\_xA (i.e. intra-band non-contiguous 2DL CA on band A) and indicating support for (4, 2) MIMO layers (i.e. 4-layer MIMO for the first band entry and 2-layer MIMO for the second band entry) also supports (2, 4) MIMO layers (i.e. 2-layer MIMO for the first band entry and 4-layer MIMO for the second band entry”, we think it is feasible, but would like to understand the difference from configuration perspective between the said (2,4) and (4,2), does it mean that the LHS number is of lower frequency in the band or something else (?) ;- if the said (4,2) MIMO layer is for a BC of xA\_xC, i.e., 2 **(different)** sub-blocks at band x of BW class A and C, then we see it infeasible if one claim that both xA(2-layer)\_xC(4-layer) and xA(4-layer)\_xC(2-layer) can be always supported – there might be an association between the MIMO layer and the carrier number, so permutation may not assumed by always feasible. |
| HW | We think only under some certain case, can the NW interpret both (4,2) and (2,4) are supported, e.g., when both carriers support UL and DL. If only one carrier supports UL while the other one is DL-only carrier, the NW can not interpret the UE supports (2, 4) MIMO layers. This is because only the carrier support UL can be allocated as the Pcell while the DL-only carrier can only be as Scell and in this case the UE capability should not be agnostic to the order, otherwise may exceed what the UE actually support and may lead to a drop of the link in the worst case |
| QualcommV4 | We share the same concerns as OPPO (i.e. same vs different BW class). There should be no difference between indicated support for the combination as xA(2-layer)\_xA(4-layer) or xA(4-layer)\_xA(2-layer). However for different BW classes, e.g. xA\_xC, support of certain feature as xA(2-layer)\_xC(4-layer) may not always mean also support in xA(4-layer)\_xC(2-layer). Further, as MIMO capability is per CC, for different BW classes it may not even make sense to exchange the order, e.g. for B1A\_B1C, for B1A there would be a single capability, and in B1C there would two values (corresponding to 2 CC), so it would be unclear what it means to exchange them. |
| Nokia, Nokia Shanghai Bell  | To address OPPO concern on the NW configuration: the NW needs to first learn and interpret the UE capabilities in a right way. We want to ensure the interpretation is correct, so that NW always follow the UE and does not exceed its capabilities (as well as does not underestimate CA options). Knowing that no assumptions or additional rules (e.g. LHS) need to apply.We think the Huawei comments are also worth understanding, while the first step is to interpret the MIMO order,Perhaps the initial step to get common understanding is to limit the clarification to the same BW classes, for instance:NOTE 6a: UE capabilities for intra-band non-contiguous CA with the band entries of one band (forming intra-band non-contiguous CA) are agnostic to the order in which they are indicatied……… |
|  |  |
|  |  |

**Table 3. Current specification interpretation on UE capabilities for non-contiguous intra-band CA**

**Conclusions:** TBA

## 3.1.2 [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip), [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip), [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip), R2-2003155: “Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs“ (Nokia, Nokia Shanghai Bell, Qualcomm Incorporated)

This section deals with DISC\_S2\_1:

***DISC S1\_2:*** *Discuss the CRs* [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip), [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip), [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip), R2-2003155 *to determine if the interpretation is correct and how a correction should be captured (if needed).*

Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments.

|  |  |
| --- | --- |
| **Company** | **Detailed comments on the proposal** |
| OPPO | We are generally fine with the intention to clarify.But maybe the cover page can further clarify the gap between the original text of “For both solutions, it is mandatory for UEs of this release of the specification if carrier aggregation with more than 5 DL component carriers is supported. “ and the new text of “If the UE supports carrier aggregation with more than 5 DL component carriers, it is mandatory to support HARQ ACK codebook size determination based on”, if that is the key motivation of this CR (e.g., one may understand that the mandatory above in legacy spec already covers the RAN1 requirement ?). |
| Ericsson | We are fine with the intention of the CR. However we suggest clarifiying the cover sheet in the impact analsys, since “functionality impacted” seems too vague:Impacted functionality: functionality impacted. |
| HW | Actually we are still confused about what is the real problem if nothing is changed? According to our understanding, the current wording already reflects the RAN1 agreement.For the first and/or, we think as there are two bits for this capability, it can indicates 1. Only (a)DAI based solution is supported
2. Only (b)CC based solution is supported
3. Both solutions are supported.

So this and/or makes sense. For the second sentence “For both solutions, it is mandatory for UEs of this release of the specification ***(to support)*** if carrier aggregation with more than 5 DL component carriers is supported.”We think the original intention to express that “it is mandatory for the UE to support….” But “to support” as we cited above is omitted (maybe to avoid using too many “support”) So here “it” does not refer to the solutions. Even though “to support” is omitted, at least for now, we don’t think it makes the spec not clear and we don’t see any problem if nothing is changed. |
| Qualcomm | In the last meeting, this was discussed and clarified what is the potential misunderstanding. It is understandable that the current text seems clear to some, but not clear to other – hence the potential of misinterpretation. Repeat from last meeting: “There are two separate IOT bits, and it should be possible to set one IOT bit while not setting other (otherwise it would have been a single bit). Current spec text is somewhat confusing: “For both solutions, it is mandatory…” not clear what “it” refers to here – B5C or sol 1 and sol 2 of codebook size determination? The confusion further comes from the word “and/or” in the first sentence.” So, this can be misinterpreted as:* Once one solution in IOTed, both bits shall be set to one, because of “This field defines whether HARQ ACK codebook size based on the DAI-based solution and/or the number of configured CCs…”
* Once one bit is set to 1, the other shall always be set to 1 based on “For both solutions, it is mandatory for UEs of this release of the specification if carrier aggregation with more than 5 DL component carriers is supported.”

But all companies agree both of the above are misinterpretations and not the real intention. Hence the need of CRs. And the intention of the CRs is to make it clear and leave no room for misinterpretation. It has been already mentioned that the CRs do not intend to change any functionality. |

**Table 4. Details of the correction(s) in** [**R2-2003152**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip)**,** [**R2-2003153**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip)**,** [**R2-2003154**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip)

**Conclusions (DISC S1\_2): There is support to clarify what is the correct interpretation this but some wording updates are needed for the CR cover page.**

* **Provide updated Rel-16 CR in R2-2003859 for further discussion**

**Conclusions:** TBA

## 3.2 Other corrections (email discussion [201])

This section deals with the remaining corrections that are proposed to be agreed by Proposal S1\_1 and S2\_1 as shown below:

***Proposal S1\_1:*** *Agree to CRs in* [*R2-2003451*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip)*,* [*R2-2003452*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip)*,* [*R2-2003453*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip)*.*

***Proposal S2\_1:*** *Agree to CRs in* [*R2-2003232*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003232.zip)*,* [*R2-2003233*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003233.zip)*,* [*R2-2002619*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002619.zip)*,* [*R2-2002620*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002620.zip)*.*

Companies are requested to indicate in case there are issues with the proposals in the summary in the table below.

|  |  |
| --- | --- |
| **Company** | **Issues to CRs in** [**R2-2003451**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip)**,** [**R2-2003452**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip)**,** [**R2-2003453**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip) |
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**Table 5. Issues with any of the CRs proposed for agreement by S1\_1**

|  |  |
| --- | --- |
| **Company** | **Issues to CRs in** [**R2-2003232**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003232.zip)**,** [**R2-2003233**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003233.zip)**,** [**R2-2002619**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002619.zip)**,** [**R2-2002620**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002620.zip) |
|  |  |
|  |  |
|  |  |

**Table 6. Issues with any of the CRs proposed for agreement by S2\_1**

**Conclusions:** TBA

# 4 Conclusions

**Agreements proposed to be agreed in this meeting (from all sub-topics)**

**Proposal S1\_1:** Agree to CRs in [R2-2003451](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip), [R2-2003452](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip), [R2-2003453](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip).

**Proposal S2\_1:** Agree to CRs in [R2-2003232](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003232.zip), [R2-2003233](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003233.zip), [R2-2002619](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002619.zip), [R2-2002620](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002620.zip).

**Proposal S2\_2:** Handle the contributions in [R2-2003569](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003569.zip), [R2-2003570](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003570.zip), [R2-2003571](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003571.zip), [R2-2003572](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003572.zip), [R2-2003573](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003573.zip) main session.

**Open items proposed to be further discussed in this meeting (from all sub-topics)**

**DISC S1\_1:** Discuss, based on [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip), [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip), [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip), [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip), [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip) and [R2-2003548](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip), [R2-2003549](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip), [R2-2003550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip), [R2-2003551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip), [R2-2003552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip), [R2-2003553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip), [R2-2003554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003554.zip), what to capture in specifications and from which release onwards.

**Conclusions (on CR release): No clear conclusion on which release. Suggest to discuss again once the changes are agreed.**

* **Discuss correction release if/when CR content is agreeed.**

**DISC S1\_2:** Discuss the CRs [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip), [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip), [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip) to determine if the interpretation is correct and how a correction should be captured (if needed).

# 5 List of referenced documents

[1] [R2-2002619](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002619.zip) Correction on SRB duplication OPPO

[2] [R2-2002620](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002620.zip) Correction on SRB duplication OPPO

[3] [R2-2003147](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003147.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell

[4] [R2-2003148](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003148.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell

[5] [R2-2003149](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003149.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell

[6] [R2-2003150](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003150.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell

[7] [R2-2003151](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003151.zip) Clarification to UE capabilities for non-contiguous intra-band CA Nokia, Nokia Shanghai Bell

[8] [R2-2003152](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003152.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated

[9] [R2-2003153](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003153.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated

[10] [R2-2003154](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003154.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated

[11] [R2-2003155](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003155.zip) Clarification on codebook-HARQ-ACK-r13 capability for CA with more than 5CCs Nokia, Nokia Shanghai Bell, Qualcomm Incorporated

[12] [R2-2003232](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003232.zip) Minor changes collected by Rapporteur Samsung Telecommunications

[13] [R2-2003233](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003233.zip) Minor changes collected by Rapporteur Samsung Telecommunications

[14] [R2-2003451](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003451.zip) Correction on autonomous measurment gap release Huawei, HiSilicon

[15] [R2-2003452](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003452.zip) Correction on autonomous measurment gap release Huawei, HiSilicon

[16] [R2-2003453](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003453.zip) Correction on autonomous measurment gap release Huawei, HiSilicon

[17] [R2-2003548](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003548.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[18] [R2-2003549](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003549.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[19] [R2-2003550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003550.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[20] [R2-2003551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003551.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[21] [R2-2003552](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003552.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[22] [R2-2003553](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003553.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[23] [R2-2003554](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003554.zip) Clarification on UE capability for intra-band non-continuous CA Huawei, Hisilicon

[24] [R2-2003569](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003569.zip) Discussion on Need code for CMAS Huawei, HiSilicon

[25] [R2-2003570](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003570.zip) Correction on Need code for CMAS Huawei, HiSilicon

[26] [R2-2003571](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003571.zip) Correction on Need code for CMAS Huawei, HiSilicon

[27] [R2-2003572](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003572.zip) Correction on Need code for CMAS Huawei, HiSilicon

[28] [R2-2003573](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003573.zip) Correction on Need code for CMAS Huawei, HiSilicon