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

Elbonia, 25 January – 05 February 2021

**Agenda item: 5.4.3**

**Source: Nokia**

**Title: Summary of [AT113-e][009][NR15] UE Capabilites EN-DC BCS (Nokia)**

**WID/SID: NR\_newRAT-Core**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

### 5.4.3 UE capabilities and Capability Coordination

* [AT113-e][009][NR15] UE Capabilites EN-DC BCS (Nokia)

Wait: Do not start email discussion until LS from R4 is available,

 Scope: Treat Incoming LS from R4. [R2-2100065](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100065.zip), [R2-2100949](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100949.zip), [R2-2101664](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101664.zip), [R2-2100388](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100388.zip), [R2-2100481](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100481.zip), [R2-2101562](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101562.zip), [R2-2101563](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101563.zip), [R2-2101564](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101564.zip), [R2-2101565](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101565.zip),

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

 Intended outcome: Report and Agreed CRs.

 Deadline: Schedule A

EN-DC BCS

R2 Treatment: Wait for R4 progress, If R4 LS becomes available, treat by email (Rapporteur to kick off email discussion) take into account RP LS, R4 LS and input tdocs: conclude whether any change to R2 TS is needed, 2: if needed

Moved from 5.1:

[R2-2100065](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100065.zip) LS on BCS reporting and support for intra-band EN-DC band combinations (RP-202935; contact: Nokia) RAN LS in Rel-15 NR\_newRAT-Core To:RAN2, RAN4

[R2-2100949](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100949.zip) Clarifying BCS for inter-band EN-DC band combination with intra-band EN-DC components Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core

[R2-2101664](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101664.zip) Discussion on BCS for intra-band EN-DC BC with inter-band component Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

[R2-2100388](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100388.zip) Clarification on BCS reporting and support for intra-band EN-DC band combinations Intel Corporation discussion Rel-15 NR\_newRAT-Core

[R2-2100481](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100481.zip) BCS reporting for intra-band EN-DC band combination Qualcomm Incorporated discussion Rel-15 NR\_newRAT-Core

[R2-2101562](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101562.zip) Clarification on the Intra-band and Inter-band EN-DC Capabilities ZTE Corporation, Sanechips discussion Rel-15 NR\_newRAT-Core

[R2-2101563](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101563.zip) CR on the Intra-band and Inter-band EN-DC Capabilities - R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.12.0 0517 - F NR\_newRAT-Core

[R2-2101564](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101564.zip) CR on the Intra-band and Inter-band EN-DC Capabilities - R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.3.0 0518 - A NR\_newRAT-Core

[R2-2101565](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101565.zip) Draft LS on the Intra-band and Inter-band EN-DC Capabilities ZTE Corporation, Sanechips LS out Rel-15 NR\_newRAT-Core To:RAN4/RAN1

* [AT113-e][009][NR15] UE Capabilites EN-DC BCS (Nokia)

Wait: Do not start email discussion until LS from R4 is available,

 Scope: Treat Incoming LS from R4. [R2-2100065](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100065.zip), [R2-2100949](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100949.zip), [R2-2101664](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101664.zip), [R2-2100388](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100388.zip), [R2-2100481](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2100481.zip), [R2-2101562](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101562.zip), [R2-2101563](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101563.zip), [R2-2101564](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101564.zip), [R2-2101565](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_113-e%5CDocs%5CR2-2101565.zip),

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

 Intended outcome: Report and Agreed CRs.

 Deadline: Schedule A

RAN4 has discussed and sent LS to RAN2 in [R2-2102403](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/LSin/R2-2102403.zip) ([R4-2102149](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_98_e/Inbox/R4-2102149.zip))

# 2 **Discussion**

**Topic 1: BCS reporting and support for intra-band EN-DC band combinations**

Based on the LS, the following aspects impact RAN2 specifications.

**Aspect 1:** Based on answer to Question A.1, a BCS is not required to be signalled by the UE for higher order band combinations for intra-band EN-DC (as defined in 38.101-3, section 5.3B.1), even if the UE doesn’t support the intra-band UL configurations DC\_66A\_n66A or DC\_71A\_n71A respectively.

* BCS reporting is optional
* BCS, if signalled, must be taken into account by network

**Aspect 2:** If a UE supports a combination that has an intra-band EN-DC component and the UE does not report an intra-band EN-DC BCS, the network may assume either a default BCS or default bandwidth combination capabilities (which of these holds is still under discussion in RAN4 and RAN2 will be subsequently informed of the decision).

**Aspect 3:** If the UE does not support UL on the intra-band EN-DC part of a band combination, then the combination is defined as a downlink inter-band and intra-band EN-DC with uplink inter-band EN-DC.

**Aspect 4:** For the band combination in Aspect 3 clarified as downlink inter-band and intra-band EN-DC with uplink inter-band EN-DC, signalling of BCS is optional as mentioned already in Aspect 1.

**Question 1**: Do companies have a common understanding of the above listed aspects?

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| Answers to Question 1 |
| Company | Yes/No | Comments |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

Based on the above the RAN2 specification changes are proposed as follows to align with RAN4 decision.

| ***supportedBandwidthCombinationSetIntraENDC***Defines the supported bandwidth combination for the band combination set as defined in the TS 38.101-3 [4]. For intra-band (NG)EN-DC with additional inter-band CA component(s) of LTE and/or NR, the field defines the bandwidth combinations for the intra-band (NG)EN-DC component. For intra-band NE-DC with additional inter-band CA component(s) of LTE and/or NR, the field defines the bandwidth combinations for the intra-band NE-DC component. Field encoded as a bit map, where bit N is set to "1" if UE support Bandwidth Combination Set N for this band combination as defined in the TS 38.101-3 [4]. The leading / leftmost bit (bit 0) corresponds to the Bandwidth Combination Set 0, the next bit corresponds to the Bandwidth Combination Set 1 and so on. * It is mandatory if the band combination is an intra-band (NG)EN-DC/NE-DC combination supporting the intra-band UL part as defined in TS 38.101-3 [4] with additional inter-band NR/LTE CA component.
* It is optional if the band combination is an intra-band (NG)EN-DC/NE-DC combination without supporting the intra-band UL part as defined in TS 38.101-3 [4]. Such a band combination is considered inter-band in the DL and the intra-band (NG)EN-DC/NE-DC part of the band combination is considered inter-band EN-DC in the UL.
 | BC | No | N/A | N/A |
| --- | --- | --- | --- | --- |

**Question 2**: Do companies think the above text proposal for TS 38.306 correctly reflects the RAN4 provided understanding?

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| Answers to Question 2 |
| Company | Yes/No | Comments to the text proposal above. |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

According to the RAN4 LS *“If the UE does not support UL on the intra-band EN-DC part of a band combination, then the combination is downlink inter-band and intra-band EN-DC with uplink inter-band EN-DC. But the UE is allowed to optionally report intra-band EN-DC BCS as answered in Question A. This may not fit into the current RAN2 signalling framework, therefore we would like RAN2 to consider it and provide feedback with RAN2 views.”*

**Q3: Do companies understand that there is no new capability implied by the statement above? To be more clear, that the current RAN2 signalling framework allows a UE to signal the BCS of a band combination which is of this type “downlink inter-band and intra-band EN-DC with uplink inter-band EN-DC”?**

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| Answers to Question 3 |
| Company | Yes/No | Comments |
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**Summary 3**: TBD.

**Proposal 3**: TBD.

# 4 Conclusion

Always echo the list of observations and proposals.

# Annex A – Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Nokia | Amaanat (Rapporteur) | amaanat.ali@nokia.com |
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