3GPP TSG-RAN WG2 Meeting #110-e [R2-2005750](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005750.zip)

Elbonia, 1 – 13 June 2020

**Agenda item: 7.6**

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

**Title:** **Summary of discussion [205] on LTE contributions in AIs 7.6, 7.8 and 7.9**

**Document for: Discussion and Decision**

# 1 Brief scope of the LTE Rel-16 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 Rel-16 topic summaries

## 2.1 TEI16

The documents in [1-4] are the only inputs to TEI16 topics.

|  |  |
| --- | --- |
| **Tdoc(s), Title, Company** | **Proposal(s)** |
| 1) [R2-2004818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004818.zip), [R2-2004820](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004820.zip), [R2-2004826](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004826.zip), [R2-2004827](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004827.zip): CR on RLC out-of-order delivery configuration (Samsung, LG Electronics Inc., Nokia, Nokia Shanghai Bell, Intel, Apple) | **Discussed and agreed in principle in RAN2#109bis-e**Clarification that RLC out-of-order delivery should only be used when t-Reordering is configured for the UE to avoid data loss. |

This topic was already discussed in RAN2#109bis-e and agreed in principle, so no further discussion is expected.

**Proposal\_S1\_1:** Agree to CRs in [R2-2004818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004818.zip), [R2-2004820](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004820.zip), [R2-2004826](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004826.zip) and [R2-2004827](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004827.zip).

## 2.2 DL MIMO efficiency enhancements for LTE

The CRs in [5-6] relate to the DL MIMO WI as shown below:

|  |  |
| --- | --- |
| **Tdoc, Title, Company** | **Proposal(s)** |
| 2) [R2-2005488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip), [R2-2005489](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip): Introduction of UE capabilities for DL MIMO efficiency enhancement (Huawei, Hisilicon) | **Postponed in RAN2#109bis-e**Proposes how to capture the UE capabilities for the DL MIMO WI based on latest RAN1 progress (as per LS in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip)).  |

These were already discussed in RAN2#109bis-e but postponed to wait for further RAN1 input (now received in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip)) as shown below:

* Discussion on UE capabilities for LTE DL MIMO efficiency enhancements is postponed to next meeting to wait further RAN1 progress.

The introduction of capabilities seems straightforward but since the topic was postponed last time, no comments were provided. Therefore, it is proposed to consider comments and attempt to agree on the current version based on the latest RAN1 LS.

**DISC S2\_1:** Discuss whether the CRs in [R2-2005488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip), [R2-2005489](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) capture the RAN1 intent for UE capabilities of DL MIMO efficiency enhancements for LTE as per LS in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip).

## 2.3 LTE-based 5G Terrestrial Broadcast

The CRs in [7-8] concern the 0.37 kHz SCS for LTE-based 5G Terrestrial Broadcast WI and the CRs in [9-10] concern the UE capabilities of the WI:

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| --- | --- |
| **Tdoc, Title, Company** | **Proposal(s)** |
| 3) [R2-2004429](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004429.zip): Correction on the configuration of subframe #0 and #5 for MCH in MBMS dedicated cell (Qualcomm Incorporated)  | **Postponed in RAN2#109bis-e**Discusses how to allow all subframes to carry MBMS in case of 0.37 kHz SCS (in dedicated MBMS carrier).  |
| 4) [R2-2005490](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005490.zip): Clarification on MCCH configuration for 0.37kHz SCS (Huawei, Hisilicon)  | **Postponed in RAN2#109bis-e**Proposes to define new structure to allow configuration of subframes #0 and #5 as MBMS MCCH subframes. |
| 5) [R2-2005224](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip), [R2-2005227](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip): MBMS UE capabilities per band for subcarrier spacing of 2.5 kHz and 0.37 kHz (Qualcomm Technologies Int)  | **New input**Proposes how to capture the UE capabilities for the LTE-based 5G Terrestrial Broadcast WI based on latest RAN1 progress (as per LS in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip)). |

The topics 3) and 4) were already discussed in RAN2#109bis-e but postponed at the end to allow more time for checking as shown below:

* Revised versions of both [R2-2003545](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003545.zip) and [R2-2003364](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003364.zip) can be submitted to next RAN2 meeting based on [R2-2003864](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003864.zip) (revision of [R2-2003545](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003545.zip)) and [R2-2003866](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003866.zip) (revision of [R2-2003364](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003364.zip)).

Since the intent was already agreeable last time, it is proposed to agree to these now without further discussion.

Finally, the topic 5) concerns the RAN1 UE capability input: The introduction of capabilities seems straightforward but since the topic was not discussed yet time, no comments were provided. Therefore, it is proposed to consider comments and attempt to agree on the current version based on the latest RAN1 LS.

**Proposal S3\_1:** Agree to CRs in [R2-2004429](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004429.zip) and [R2-2005490](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005490.zip).

**DISC S3\_1:** Discuss whether the CRs in [R2-2005224](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip) and [R2-2005227](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip) capture the RAN1 intent for UE capabilities of LTE-based 5G Terrestrial Broadcast as per LS in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip).

# 3 Company comments to the contributions

## 3.1 DL MIMO efficiency enhancements for LTE

This section deals with the capability signalling that is proposed to be endorsed as per Proposal S2\_1 as shown below:

***DISC S2\_1:*** *Discuss whether the CRs in* [*R2-2005488*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip)*,* [*R2-2005489*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) *capture the RAN1 intent for UE capabilities of DL MIMO efficiency enhancements for LTE as per LS in* [*R1-2003070*](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip)*.*

Companies are requested to indicate if there are any issues that require discussion within the CRs [R2-2005488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip), [R2-2005489](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) in the summary in the table below.

|  |  |
| --- | --- |
| **Company** | **Issues to discuss for UE capability CRs in** [**R2-2005488**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip)**,** [**R2-2005489**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) |
| Qualcomm | Thanks for the CRs, but there are too many changes that need to be made before this becomes agreeable. So, instead of listing them all here, I will upload my comments to drafts folder directly based on the CR. Currently provided only for 331, because I assume 306 would also be updated based on these comments.In general: * The capabilities currently captured are not in line with RAN1 LS.
* Field descriptions can be improved.
* Suggestions on field names are included.
* Various typos corrected.

Also additional general comment: For the parameters that are per BoBC, do we need to add them to FeatureSetUL? |
| HW | Thanks Umesh for all the suggestions. Updated versions on both 36331 CR and 36306 CR have been uploaded in the draft folder for further review. Regarding whether to add them in FeatureSetUL, I think this relates to whether we will introduce this feature in MRDC, which still needs some further discussion. So currently we prefer to not add them in FeatureSetUL. In addition, RAN1 agreed to add one more UE capability during this week, which is reflected as well in the updated versions.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3-1 | Additional SRS symbols within normal UL subframes without frequency hopping | 1. Support of additional 1~13 SRS symbols within normal UL subframes with repetitions,   |  | Yes | N/A | Network cannot utilize additional SRS symbols within normal UL subframes | Per UE | TDD only | N/A | ~~FFS: How to capture the limitation that a UE may support additional SRS in cells with PUSCH, but not in PUSCH-less SCells. This may be realized by additional capability signaling (including new FG), or change the “additional SRS” (3-1) to per BoBC~~ | Optional with capability signalling |
| 3-1C | Additional SRS symbols within normal UL subframes with SRS carrier switching | 1. Support of additional 1~13 SRS symbols within normal UL subframes with SRS carrier switching   | 3-1, SRS carrier switching | Yes | N/A | Network cannot utilize additional SRS symbols within normal UL subframes with SRS carrier switching | Per UE + Per Band Pair of Band combination | N/A | N/A | For each band pair for which the UE reports SRS carrier switching capability (retuningTimeInfoBandList), the UE indicates whether additional SRS within normal UL subframes can be used. Note: if the UE supports additional SRS in all the band pairs in which it supports SRS CS, there is no need to indicate it for each band pair individually | Optional with capability signalling |

 |
| Ericsson | The CRs look ok.  |
|  |  |

**Table 3. Issues to be discussed for UE capabilities for DL MIMO efficiency enhancements for LTE**

**Conclusions (DISC S2\_1): Changes according to updated CRs may be acceptable but require checking as also further RAN1 updates were incorporated.**

* Continue checking the CRs via email discussion until Wednesday, June 10th to come up with agreeable versions.

## 3.3 LTE-based 5G Terrestrial Broadcast

This section deals with the discussion as per DISC S3\_1as shown below:

***DISC S3\_1:*** *Discuss whether the CRs in* [*R2-2005224*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip) *and* [*R2-2005227*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip) *capture the RAN1 intent for UE capabilities of LTE-based 5G Terrestrial Broadcast as per LS in* [*R1-2003070*](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip)*.*

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

Companies are requested to indicate if there are any issues that require discussion within the CRs [R2-2005224](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip), [R2-2005227](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip) in the summary in the table below.

|  |  |
| --- | --- |
| **Company** | **Issues to discuss for UE capability CRs in** [**R2-2005224**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip)**,** [**R2-2005227**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip) |
| Qualcomm | We would like to update that RAN2 further received one more LS from RAN1 in R2-2006033, so we went ahead and updated the 36.306 CR and uploaded to the drafts folder (1 change is new as indicated in coverpage). Please review the revised version. Formal Tdoc to be submitted based on further comments, if any. |
| HW | Thanks for the CRs. One small comment on 331 CR***mbms-SupportedBandInfoList*** One entry corresponding to each supported E-UTRA band is listed in the same order as in *supportedBandListEUTRA*. This list is included only if *fembmsMixedCell* or *fembmsDedicatedCell* is included.  |
| Ericsson | CRs look ok. |
|  |  |

**Table 3. Issues to be discussed for UE capabilities for LTE-based 5G Terrestrial Broadcast**

**Conclusions (DISC S3\_1): The CRs appear agreeable with updates.**

* Agree to the intent of the CRs in R2-2005224 and R2-2005227. Provide final versions via email discussion and agree over email discussion.

# 4 Conclusions

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

**Proposal\_S1\_1:** Agree to CRs in [R2-2004818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004818.zip), [R2-2004820](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004820.zip), [R2-2004826](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004826.zip) and [R2-2004827](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004827.zip).

**Proposal S3\_1:** Agree to CRs in [R2-2004429](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004429.zip) and [R2-2005490](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005490.zip).

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

**DISC S2\_1:** Discuss whether the CRs in [R2-2005488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip), [R2-2005489](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) capture the RAN1 intent for UE capabilities of DL MIMO efficiency enhancements for LTE as per LS in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip).

**Conclusions (DISC S2\_1): Changes according to updated CRs may be acceptable but require checking as also further RAN1 updates were incorporated.**

* Continue checking the updates to the CRs [R2-2005488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip), [R2-2005489](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) via email discussion until Wednesday, June 10th to come up with agreeable versions.

**DISC S3\_1:** Discuss whether the CRs in [R2-2005224](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip) and [R2-2005227](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip) capture the RAN1 intent for UE capabilities of LTE-based 5G Terrestrial Broadcast as per LS in [R1-2003070](http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_100b_e/Docs/R1-2003070.zip).

**Conclusions (DISC S3\_1): The CRs appear agreeable with updates.**

* Agree to the intent of the CRs in R2-2005224 and R2-2005227. Provide final versions via email discussion and agree over email discussion.

# 5 List of referenced documents

[1] [R2-2004818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004818.zip) CR on RLC out-of-order delivery configuration Samsung, LG Electronics Inc., Nokia, Nokia Shanghai Bell, Intel, Apple CR Rel-15 36.323 15.5.0 0283 1 F TEI15, LTE\_HRLLC-Core [R2-2003860](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003860.zip)

[2] [R2-2004820](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004820.zip) CR on RLC out-of-order delivery configuration Samsung, LG Electronics Inc., Nokia, Nokia Shanghai Bell, Intel, Apple CR Rel-16 36.323 16.0.0 0284 1 A TEI16 [R2-2003861](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003861.zip)

[3] [R2-2004826](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004826.zip) CR on RLC out-of-order delivery configuration Samsung, LG Electronics Inc., Nokia, Nokia Shanghai Bell, Intel, Apple CR Rel-15 36.331 15.9.0 4288 1 F TEI15, LTE\_HRLLC-Core [R2-2003862](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003862.zip)

[4] [R2-2004827](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004827.zip) CR on RLC out-of-order delivery configuration Samsung, LG Electronics Inc., Nokia, Nokia Shanghai Bell, Intel, Apple CR Rel-16 36.331 16.0.0 4240 2 F TEI16 [R2-2003863](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003863.zip)

[5] [R2-2005488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005488.zip) Introduction of UE capabilities for DL MIMO efficiency enhancement Huawei, Hisilicon CR Rel-16 36.331 16.0.0 4334 - B LTE\_DL\_MIMO\_EE-Core

[6] [R2-2005489](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005489.zip) Introduction of UE capabilities for DL MIMO efficiency enhancement Huawei, Hisilicon CR Rel-16 36.306 16.0.0 1770 - B LTE\_DL\_MIMO\_EE-Core

[7] [R2-2004429](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2004429.zip) Correction on the configuration of subframe #0 and #5 for MCH in MBMS dedicated cell Qualcomm Incorporated CR Rel-16 36.331 16.0.0 4259 2 F LTE\_terr\_bcast-Core [R2-2003866](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2003866.zip)

[8] [R2-2005490](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005490.zip) Clarification on MCCH configuration for 0.37kHz SCS Huawei, Hisilicon CR Rel-16 36.331 16.0.0 4335 - F LTE\_terr\_bcast-Core

[9] [R2-2005224](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005224.zip) MBMS UE capabilities per band for subcarrier spacing of 2.5 kHz and 0.37 kHz Qualcomm Technologies Int CR Rel-16 36.331 16.0.0 4307 - F LTE\_terr\_bcast-Core

[10] [R2-2005227](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_110-e/Docs/R2-2005227.zip) MBMS UE capabilities per band for subcarrier spacing of 2.5 kHz and 0.37 kHz Qualcomm Technologies Int CR Rel-16 36.306 16.0.0 1764 - F LTE\_terr\_bcast-Core