3GPP TSG-RAN WG2 #113e Tdoc DocNumber

Electronic meeting, 2021-01-25 - 2021-02-05

Agenda Item: 6.16

Source: Ericsson

Title: Summary of [AT113-e][029][TEI16] Miscellaneous II (Ericsson)

Document for: Discussion

# 1 Introduction

This is the summary of the following email discussion:

* [AT113-e][029][TEI16] Miscellaneous II (Ericsson)

 Scope: R2-2100560, R2-2100561, R2-2100562, R2-2100484, R2-2101288, R2-2101243, R2-2101734

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

 Intended outcome: Report and Agreed CRs if any agreeable.

 Deadline: Schedule A

Please take note of the following deadlines (i.e. Schedule A):

Deadline for Phase 1: **Thursday Jan 28 12:00 UTC**

Deadline for Phase 2: **Thursday Feb 4 12:00 UTC**

# 2 Contact Information

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# 3 Discussion

## 3.1 Voice Fallback Indication

Voice Fallback Indication – Postponed from last meeting

[R2-2100560](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2100560.zip) Further discuss the usage of voiceFallbackIndication for Emergency Service Fallback ZTE Corporation, Sanechips discussion Rel-16 TEI16

[R2-2100561](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2100561.zip) CR to clarify the usage of voiceFallbackIndication for Emergency Services Fallback ZTE Corporation, Sanechips CR Rel-16 38.331 16.3.1 2048 1 F TEI16 R2-2009241

[R2-2100562](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2100562.zip) CR to introduce new capability for Emergency Services Fallback ZTE Corporation, Sanechips CR Rel-16 38.306 16.3.0 0492 - F TEI16

[R2-2100484](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2100484.zip) Clarify the usage of voiceFallbackIndication for emergency service Ericsson discussion Rel-16 TEI16

There are two ways to support emergency calls when IMS voice is not supported in 5GS:

* EPS fallback for IMS voice: The gNB redirects or handovers the UE to EPS when receiving QoS flow setup request from CN. And this may be triggered also for emergency QoS flow.
* Emergency service fallback: When the UE wants to initiate an emergency call it sends an emergency services fallback request to 5GC which in turn notifies NG-RAN which will redirect or handover the UE to EPS.

As can be seen, a main difference between the two approaches is that EPS fallback for IMS voice is network triggered while Emergency services fallback is UE triggered.

During RAN2#112 it was discussed whether the *voiceFallbackIndication* should be included in the redirect or handover message also for Emergency services fallback. In the redirect case the UE needs to set the establishment cause to “emergency” in the subsequent connection setup and it was concluded that this can be done without the indication since the UE is aware of the ongoing emergency call. Hence the *voiceFallbackIndication* is not included in the redirect message for Emergency services fallback. For the handover case the UE should prioritize E-UTRA cells in case the handover fails and there were different views whether the indication is needed for this purpose:

* [029] Regarding how to support “first attempt E-UTRAN cell upon HO failure” in case of emergency service fallback, postpone the discussion to next meeting. Following options can be considered:

Opt 1: leave it to UE implemetation;

Opt 2: reuse voiceFallbackIndication-r16 sent by network (FFS on new capability).

Basically [R2-2100484](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2100484.zip) argues for the first option while [R2-2100560](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2100560.zip) argues for the second option.

**Issue 1:** Which option do you prefer?

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| **Company** | **Which option?** | **Comments** |
| Ericsson | Option 1 | The UE is aware of the ongoing emergency call and knows that it should prioritize E-UTRA cells in case the handover fails. Therefore, no indication is needed. This is also consistent with the agreement made for the redirect case. If needed, we can capture that the UE should prioritize E-UTRA cells in a requirement or informative note in the handover failure section in the RRC specification. |
| Lenovo | Option 1 | Referring to TS 23.502 we understand that it’s up to NW to include the voiceFallbackIndication in the redirect or handover message for Emergency services fallback depending on UE capability. However, from UE perspective this indication does not matter and we can leave it to UE implementation to prioritize E-UTRA cells when handover failure happens. We are fine with an informative note in RRC to capture this case. |
| ZTE | Option 2, Option 1 is acceptable | As long as all UE vendors confirm Option 1 is feasible and already be supported by UE implementation, we are fine to go for it. Otherwise, we would prefer to do the same as for “EPS fallback for IMS service” case (Option 2 with new capability). |
| Apple | Optino 1 | We support to left this to UE implementation.  |
| Huawei, HiSilicon | Option 1 | It was already discussed and clarified in last meeting that EPS fallback for IMS voice and Emergency service fallback are different procedures, where the first one is triggered by RAN, but the latter one is triggered by UE itself, so that RAN2 TEI *voiceFallbackIndication* applies to EPS fallback for IMS voice but not Emergency service fallback. We agree with Ericsson there is no need to send indication to UE as UE is aware of the Emergency service of itself. Thus it would be enough leaving to UE implementation. A Note seems not necessary either. |
| Qualcomm | Option 1 | We share the view with Ericsson that UE knows the emergency call is ongoing and hence can make right decision in prioritizing E-UTRA in case the handover fails. |
| LG | Option 2 | While we think option 1 is feasible given that UE is aware of the on-going emergency call, we prefer option2 because UE implementation is consistent and straightforward for all voice fallback cases.  |
| MediaTek | Option 1 | We think there is no need to have the complicate description and new capability for this function. The UE is anyway aware the emergency fallback is ongoing and it should of course not revert back to NR in case of handover failure.  |
| CATT | Option 1 | We share the same view with Ericsson and think it can be left to UE implementation. |
| Samsung | Option 1 | We agree with earlier comments from Ericsson. |
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## 3.2 HO to EN-DC

[R2-2101288](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101288.zip) Complete message at handover NR to EN-DC Ericsson CR Rel-16 38.331 16.3.1 2401 - F TEI16

Reason for change:

CR 1948r1 ([R2-2008509](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2008509.zip)) introduced missing procedure text for the transmission of RRCReconfigurationComplete for case of HO from NR to EN-DC.

But the procedure text was introduced at a position for the case “UE in EN-DC”. This makes the existing procedure text confusing. At HO from NR to EN-DC, UE will not be in EN-DC until after the procedure is completed. Further, existing procedure text gives the impression that conditional reconfiguration is applicable for handover NR to EN-DC. This is not true.

**Issue 2a:** Do companies agree with the reason for change?

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| **Company** | **Yes/No** | **Comments (e.g. other comments on the cover page)** |
| Ericsson | Yes |  |
| ZTE | See comments | In our understanding, the UE generates RRCReconfigruationComplete message only after applying the RRCReconfiguration message. So at that moment, the UE is already in EN-DC. We think the below paragraph also applies to the case when EN-DC is setup (e.g. SN addition), so that is why we use “was” in the sentences, right?1> if the UE is configured with E-UTRA *nr-SecondaryCellGroupConfig* (UE in (NG)EN-DC):2> if the *RRCReconfiguration* message was received via E-UTRA SRB1 as specified in TS 36.331 [10]; |
| Apple | Yes |  |
| Huawei, HiSilicon | No | The same issue has been discussed in RAN2 #111e during the offline discussion [AT111-e][041][TEI16]. And the corresponding CR was agreed in [R2-2008509](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2008509.zip). The change is in 5.3.5.3 adding the handling of *RRCReconfigurationComplete* for case of HO from NR to EN-DC. The reason for change is copied below:The handling of *RRCReconfigurationComplete* for case of HO from NR to EN-DC is mssing, i.e. there is no entry for UE receiving the EN-DC configuration from *MobilityFromNRCommand* via NR. In this case, if following the current procedure text as below, during HO from NR to EN-DC, the UE configured with EN-DC in target side will not submit the NR *RRCReconfigurationComplete* in response to NR *RRCReconfiguration* embedded in E-UTRA *RRCConnectionReconfiguration* within *MobilityFromNRCommand*. The UE will only submit the E-UTRA *RRCReconfigurationComplete* in response to E-UTRA *RRCConnectionReconfiguration* within *MobilityFromNRCommand*. |
| Qualcomm | Yes |  |
| LG | Yes |  |
| MediaTek | Yes |  |
| CATT | No | Agree with the ZTE’s comment, the UE applies the reconfiguration with SCG, so the UE has been configured with ENDC |
| Samsung | Yes, but | We think ZTE's comment has a point i.e. wouldn't UE already consider to be in EN-DC at point where the concerned part is executed? |
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**Issue 2b:** Do companies agree with the proposed correction in sections 5.3.5.3 in 38.331?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes |  |
| ZTE | No | See comments to Q2a. |
| Apple | Yes |  |
| Huawei, HiSilicon | No | See comments to Issue 2a. |
| Qualcomm | Yes |  |
| LG | Yes |  |
| MediaTek | Yes |  |
| CATT | No |  |
| Samsung | Yes, but | See comments to the previous question. |
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## 3.3 Aperiodic CSI with secondary DRX

[R2-2101243](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101243.zip) Consideration on aperiodic CSI with secondary DRX CATT discussion Rel-16

[R2-2101734](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101734.zip) Secondary DRX and aperiodic CSI Ericsson discussion Rel-16 TEI16 R2-2009948

This topic was discussed during RAN2#112-e in offline #028 ([R2-2011214](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2011214.zip)), where it was discussed, but not concluded:

1. There is power consumption impact
2. There is RAN1 impact to support aperiodic CSI with secondary DRX
3. Aperiodic CSI is cross carrier scheduling which is not supported with secondary DRX
4. Aperiodic CSI with secondary DRX is an enhancement

These topics are again discussed in both [R2-2101243](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101243.zip) and [R2-2101734](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101734.zip).

During offline #028 there was some confusion how aperiodic CSI with secondary DRX would work, which is clarified in [R2-2101734](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101734.zip):

* There is no change to the CSI measurement requirements, i.e. the UE is only required to measure during Active Time.
* The UE reports the latest measurement on FR2, when CSI is triggered on FR1 for FR2, and FR2 is outside Active Time.
* The aperiodic CSI trigger and CSI report on PUSH are configured on the same carrier, i.e. not on different carriers/FRs.



**Issue 3a:** Do companies think there is power consumption impact to support aperiodic CSI with secondary DRX?

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| **Company** | **Yes/No** | **Comments (e.g. other comments on the cover page)** |
| Ericsson | No | The UE is not required to measure outside Active Time, and the UE reports the latest measurement on FR2 when FR2 is outside Active Time. |
| Apple | Yes | For the proposal to let UE report the latest measurement on FR2, when CSI is triggered on FR1 for FR2, and FR2 is outside Active Time, we think there still power consumption impact. UE reporting CSI in FR1, but there is no active traffic in FR2 carrier. The CSI reporting itself wastes UE power. |
| Huawei, HiSilicon |  | The proponent should first clarify if the CSI trigger/measure and report are on the same serving cell or different cell. According to the discussion in the last meeting, the focus is if they belong to different cell/FR, it would couple the DRX operations of both secondary DRX groups that cause additional power. |
| Qualcomm | No | We do not expect impact on power. In the scenario depicted in the right-hand side of the figure above, because the CSI trigger and PUSCH resource for the CSI report have to be on the same carrier (since cross-carrier scheduling is not allowed when secondary DRX is configured), FR2 carrier does not need to wake up – this is because UE reports the last measurement taken during the latest DRX active time (38.213). |
| LG | Yes | The UE should wake up the secondary DRX group to report A-CSI on FR2. This would cause power consumption on FR2. |
| MediaTek | Basically no | With the further clarification that CSI reporting is sending on the same carrier, we think maybe there would be no additional power consumption.  |
| CATT | Yes | We agree with Huawei. |
| Samsung | Yes | Depending on solution, we see a trade-off relationship between power saving gain and CSI accuracy.With the suggestion, no impact in power consumption could result in inaccurate CSI (i.e. outdated).Since it may be related to CSI accuracy, we are not sure if RAN2 itself can decide any solution. |
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**Issue 3b:** Do companies think there is RAN1 impact to support aperiodic CSI with secondary DRX?

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| **Company** | **Yes/No** | **Comments (e.g. other comments on the cover page)** |
| Ericsson | No | Aperiodic CSI and cross slot scheduling are two different features, i.e. CSI trigger is not a scheduling DCI. Furthermore the aperiodic CSI trigger and CSI report on PUSH are on the same carrier. |
| Apple | Yes | Need to check RAN1 |
| Huawei, HiSilicon | Yes (may be) | Currently CSI measurement is transparent to MAC spec and executed in PHY, while MAC is only responsible to determine whether to report CSI in presence of DRX. Therefore, we are not sure if there is any impact to the RAN2 spec. On the contrary, we are concerned on the second bullet that “The UE reports the latest measurement on FR2, where the cross-carrier measurement may need to be consulted with RAN1 and RAN4. |
| Qualcomm | No | We agree with the clarifications provided in [R2-2101734](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_113-e/Docs/R2-2101734.zip) (which are also copied in rapporteur’s summary above). |
| LG | Maybe | Reporting A-CSI outside the Active Time needs to be checked in RAN1. In current specification, RAN1 specification is already referred.NOTE 4: If a UE multiplexes a CSI configured on PUCCH with other overlapping UCI(s) according to the procedure specified in TS 38.213 [6] clause 9.2.5 and this CSI multiplexed with other UCI(s) would be reported on a PUCCH resource outside DRX Active Time of the DRX group in which this PUCCH is configured, it is up to UE implementation whether to report this CSI multiplexed with other UCI(s). |
| MediaTek | Maybe No | Assuming no impact to RAN1 but we could confirm with RAN1. |
| CATT | Yes | In our understanding, there may be impacts on RAN1. And we need to ask RAN1 to investigate. |
| Samsung | Yes |  |
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**Issue 3c:** Do companies think that aperiodic CSI is cross carrier scheduling?

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| **Company** | **Yes/No** | **Comments (e.g. other comments on the cover page)** |
| Ericsson | No | RAN1 introduced aperiodic CSI across different SCS in REL-16, i.e. there is no further RAN1 impact |
| Apple | Yes | This is similar to cross-carrier scheduling. |
| Huawei, HiSilicon |  | It depends on Issue 3a |
| Qualcomm | No | Although whether cross-carrier scheduling is configured can affect how aperiodic A-CSI may be scheduled, cross-carrier scheduling is definitely not aperiodic CSI, just like apple is not orange 😊. Cross-carrier scheduling = PDCCH and the corresponding PDSCH/PUSCH are scheduled on different carriers. When secondary DRX is configured, A-CSI trigger (PDCCH part) and the CSI report (PUSCH part) have to be on the same carrier because cross-carrier scheduling can’t be jointly configured with secondary DRX. However, the measurement can be configured on any cell, regardless of whether cross-carrier scheduling is configured or not, if that’s enabled by network. |
| LG | Yes | We think A-CSI with secondary DRX is similar to cross-carrier scheduling. |
| MediaTek | No, but | We think it is not so critical to define whether this is cross-carrier scheduling or not. The key is that whether there is additional RAN1 impact or power consumption, which we would like to avoid. |
| CATT | Depends on whether aperiodic CSI is reported on the same serving cell or not | If aperiodic CSI is reported on different carrier, PDCCH carries CIF and PUSCH of another serving cell. It is similar as cross carrier scheduling. But if aperiodic CSI is reported on the same carrier, it is just one normal aperiodic CSI trigger. |
| Samsung | - | In our view, it’s not important to clarify if the aperiodic CSI is cross carrier scheduling. We need to discuss if aperiodic CSI will be handled similar to cross-carrier scheduling when secondary DRX has been configured, or if we will specify new behaviour. |
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**Issue 3d:** Do companies think that aperiodic CSI with secondary DRX is an enhancement?

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| **Company** | **Yes/No** | **Comments (e.g. other comments on the cover page)** |
| Ericsson | No | Similar as periodic CSI and secondary DRX it is not an optimization |
| Apple | Yes | Compared with the baseline cross-carrier CSI reporting, this is an optimization, |
| Huawei, HiSilicon | Yes | If FR2 is in sleep but report the latest CSI measurement, the CSI is not timely and inaccurate, so we see the benefit is marginal while it may have risk of further RAN1 and RAN4 impact. So we think it is an optimization. |
| Qualcomm | No | Aperiodic CSI is a feature whose behavior is independent from whether secondary DRX is configured or not. |
| LG | Yes | The A-CSI with secondary DRX couples two DRX groups, similar to cross-carrier scheduling. We think such coupling between two DRX groups should be avoided at least in Rel-16. Moreover, the gain is not clear. |
| MediaTek | No strong view |  |
| CATT | Yes | We see there is still some impacts on RAN1 and also agree Huawei that the benefits are not so obvious. So in our understanding, this is an enhancement. |
| Samsung | Yes |  |
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**Issue 3e:** Clarify in 38.331 that the aperiodic CSI trigger and CSI report on PUSCH on the same carrier is supported when secondary DRX is configured?

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | Based on CR discussed in RAN2#112-e ([R2-2009948](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_112-e/Docs/R2-2009948.zip)) the following draft text is provided for information:***schedulingCellId***Indicates which cell signals the downlink allocations and uplink grants, if applicable, for the concerned SCell. In case the UE is configured with DC, the scheduling cell is part of the same cell group (i.e. MCG or SCG) as the scheduled cell. If *drx-ConfigSecondaryGroup* is configured in the *MAC-CellGroupConfig* associated with this serving cell, the scheduling cell and the scheduled cell belong to the same Frequency Range. If *drx-ConfigSecondaryGroup* is configured in the *MAC-CellGroupConfig* associated with this serving cell, the serving cell with the aperiodic CSI trigger and PUSCH configured for reporting on the same carrier, the cell for which CSI is reported may belong to the same or different Frequency Range. |
| Apple | No | As we do not support to cross-carrier CSI reporting when 2nd DRX is configured. in the TP provided by Ericsson, we should also restrict the measured cells to be in the same DRX group  |
| Huawei, HiSilicon | No | See our comments above |
| Qualcomm | Yes | We are fine with adding a clarification to the field description. But we’d like to suggest a few minor editorial changes:***schedulingCellId***Indicates which cell signals the downlink allocations and uplink grants, if applicable, for the concerned SCell. In case the UE is configured with DC, the scheduling cell is part of the same cell group (i.e. MCG or SCG) as the scheduled cell. If *drx-ConfigSecondaryGroup* is configured in the *MAC-CellGroupConfig* associated with this serving cell, the scheduling cell and the scheduled cell belong to the same Frequency Range.In addition, the serving cell with an aperiodic CSI trigger and the PUSCH resource scheduled for the report are on the same carrier, but the cell for which CSI is reported may belong to the same or different Frequency Range. |
| MediaTek | Yes | We could further discuss the wording. |
| CATT | No | We think cross carrier CSI reporting is similar as cross carrier scheduling. There is no need to clarify it in the specification. And we don’t support cross-carrier aperiodic CSI reporting and secondary DRX group are configured simultaneously either. |
| Samsung | No |  |
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# Conclusion

TBA

# References