3GPP TSG-RAN WG2 Meeting #112 Electronic R2-200XXXX

Elbonia, 02 – 13 November 2020

**Agenda item: 6.8.2**

**Source: Rapporetuer (Nokia)**

**Title: [AT111-e][221][DCCA] Fast Scell activation and early measurements (Nokia)**

**WID/SID: LTE\_NR\_DC\_CA\_enh-Core-**

**Release: Release 16**

**Document for: Discussion and Decision**

# 1 Introduction

This is discussion document for the email:

* [AT111-e][221][DCCA] Fast Scell activation and early measurements (Nokia)

Scope:

* + - Discuss corrections under 6.8.2/6.8.3 marked for this discussion to see which CRs could be agreeable

Intended outcome:

* + - Discussion summary in R2-2010731 (by email rapporteur).

Deadline for providing comments, for rapporteur inputs, conclusions and CR finalization:

* + - Initial deadline (for companies' feedback): 1st week Fri, UTC 0900
    - Initial deadline (for rapporteur's summary in R2-2010731): 2nd week Mon, UTC 13:00

where following documents are to be treated:

### 6.8.2 Fast Scell activation

By Email [221] (5)

*SCell dormancy, MAC corrections:*

[R2-2009549](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009549.zip) Dormancy correction Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.2.0 0934 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2009573](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009573.zip) Corrections on bwp-InactivityTimer Samsung CR Rel-16 38.321 16.2.1 0935 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2008927](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2008927.zip) Correction on RA upon BWP switching to dormant BWP Asia Pacific Telecom co. Ltd CR Rel-16 38.321 16.2.1 0901 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2010022](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010022.zip) Timing of direct SCell activation upon RRC configuration Ericsson CR Rel-16 38.321 16.2.1 0956 - F LTE\_NR\_DC\_CA\_enh-Core

* Email 221

*SCell dormancy, UE capabilities:*

[R2-2009550](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009550.zip) BWP support for dormancy Nokia, Nokia Shanghai Bell discussion Rel-16 LTE\_NR\_DC\_CA\_enh-Core

* Email 221

### 6.8.3 Early measurement reporting

By Email [221] (2)

*Applicability to serving carrier measurements:*

[R2-2009551](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009551.zip) Measurement applicability and validity Nokia, Nokia Shanghai Bell CR Rel-15 36.331 15.11.0 4468 - F LTE\_euCA-Core

[R2-2009552](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009552.zip) Measurement applicability and validity Nokia, Nokia Shanghai Bell CR Rel-16 36.331 16.2.1 4469 - F LTE\_euCA-Core, LTE\_NR\_DC\_CA\_enh-Core

[R2-2009553](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009553.zip) Measurement applicability and validity Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.2.0 2090 - F LTE\_NR\_DC\_CA\_enh-Core

* Email 221

*Clarification to IDLE mode measurement storing procedural text:*

[R2-2010023](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010023.zip) Serving cell results for early measurements Ericsson CR Rel-16 38.331 16.2.0 2162 - F LTE\_NR\_DC\_CA\_enh-Core

* Email 221

By Email [221] (1)

*Indication of T331 expiration in measurements:*

[R2-2010024](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010024.zip) Early measurement requirements Ericsson discussion LTE\_NR\_DC\_CA\_enh-Core

* Email 221

By Email [221] (1)

*Usage of SIB indication for early measurements:*

[R2-2010653](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010653.zip) Reporting of dle/inactive measurement not obtained in the current cell Huawei, HiSilicon CR Rel-16 36.331 16.2.1 4528 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2010654](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010654.zip) Reporting of dle/inactive measurement not obtained in the current cell Huawei, HiSilicon CR Rel-16 38.331 16.2.0 2268 - F LTE\_NR\_DC\_CA\_enh-Core

* Email 221

# 2 Discussion

## 2.1 Fast SCell activation

[R2-2009549](file:///C:\\Users\\terhentt\\Documents\\Tdocs\\RAN2\\RAN2_112-e\\R2-2009549.zip) Dormancy correction Nokia, Nokia Shanghai Bell CR Rel-16 38.321 16.2.0 0934 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2009573](file:///C:\\Users\\terhentt\\Documents\\Tdocs\\RAN2\\RAN2_112-e\\R2-2009573.zip) Corrections on bwp-InactivityTimer Samsung CR Rel-16 38.321 16.2.1 0935 - F LTE\_NR\_DC\_CA\_enh-Core

Two above papers affect same part of the specification – One removing a else branch from 5.9 claiming it to be obsolete and other one aligning with wording in legacy. Please provide your view below on the proposed CRs:

|  |  |  |
| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | Yes (removing the else branch) | As explained in the CR coversheet There is redundant UE actions in case of activated BWP is dormant BWP in 5.9 (activation/deactivation of SCells). bwp-InactivityTimer is attemted to be stopped before even activating a BWP for a SCell which either was deactivated before the action or just newly configured by RRC. This seems logically incorrect. Furthermore, upon activation the BWP, same action is already performed in 5.15.1. (BWP), ie., the bwp-InactivityTimer is stopped if the activated DL BWP is dormant BWP. |
| Qualcomm | Yes with comments | First, we agree the CR to remove the else branch.  Then, we need to point out that we raised this issue in email discussion#037 of RAN2#119bis-e. However, two companies disagreed with the argurement: “*Current 38.321 already have similar duplication for activation of SCell and deactivation SCell in both 5.9 and 5.15. And* *bwp-InactivityTimer is for each SCell, i.e. cell specific behavior*.“  Thus, we are wondering: whether we need to align the same style of 38.321? |
| Asia Pacific Telecom (APT) | Yes (for Nokia’s CR)  No strong view (for Samsung’s CR) | For Nokia’s CR, it’s good to remove the duplicated sentence with the same behavior which is already captured in another agenda item.  For Samsung’s CR, we have no strong view on if it’s needed to highlight that the timer is only applied for SCell in this case, since the current sentence seems not cause error. |
| Samsung | No (for 9549) and  Proponent (for 9573) | Even if a SCell was activated and its bwpInactivityTimer was running, the network can indicate BWP switching to dormant BWP by RRCReconfiguration. We think it’s the reason why we captured the yellow part below. So, It would be better to cover this case by keeping the current specification as follows:  2> if the SCell is configured with *sCellState* set to *activated* upon SCell configuration:  3> if *firstActiveDownlinkBWP-Id* is not set to dormant BWP:  4> activate the SCell according to the timing defined in TS 38.213 [6]; i.e. apply normal SCell operation including:  5> SRS transmissions on the SCell;  5> CSI reporting for the SCell;  5> PDCCH monitoring on the SCell;  5> PDCCH monitoring for the SCell;  5> PUCCH transmissions on the SCell, if configured.  3> else (i.e. *firstActiveDownlinkBWP-Id* is set to dormant BWP):  4> stop the *bwp-InactivityTimer* of this Serving Cell, if running. |
| MediaTek | No strong view for 9549  No for 9573 | On 9549, we are fine to to remove the duplicated sentence but assuming that it is no harm keep it.  On 9573, we do not really see the problem of original wording. |
| ZTE | No strong view for 9549  No for 9573 | On 9549, we agree there is some duplication, but we also see no harm to keep it.  For 9573, as mentioned in the CR cover page, dormant BWP can only be configured for SCell, so there is no room for misunderstanding. |
| Ericsson | Yes to 9549 with changes.  No to 9573 | The stopping of the *bwp-InactivityTimer* may be superfluous for the case of SCell addition, but since there is the check first whether timer is running or not, nothing is broken.  However, as Qualcomm mentions it would be good to capture the stopping of *bwp-InactivityTimer* when switching BWP to dormant BWP, which is not covered in 5.9. Instead, stopping the *bwp-InactivityTimer* could be added in the procedural text in 5.15.1, right at the end there is the procedure for BWP switching, e.g. with the highlighted lines below:  1> if a PDCCH for BWP switching is received, and the MAC entity switches the active DL BWP:  2> if the *defaultDownlinkBWP-Id* is configured, and the MAC entity switches to the DL BWP which is not indicated by the *defaultDownlinkBWP-Id* and is not indicated by the *dormantBWP-Id* if configured; or  2> if the *defaultDownlinkBWP-Id* is not configured, and the MAC entity switches to the DL BWP which is not the *initialDownlinkBWP* and is not indicated by the *dormantBWP-Id* if configured:  3> start or restart the *bwp-InactivityTimer* associated with the active DL BWP.  2> If the MAC entity switches to the DL BWP which is indicated by the *dormantBWP-Id*):  3> stop the *bwp-InactivityTimer* of this Serving Cell, if running.  Regarding the Samsung CR, it is true that we use often the “associated with this SCell“ terminology, but there are also occurences of “of this SCell“. Anyway, if we agree to remove the else statement and replace with the above, the CR is not needed. |
| Huawei | No | Seems nothing is broken without the changes.  In addition, supposing we have the 1st change, the explanation in the coversheet of [R2-2009549](file:///C:\\Users\\terhentt\\Documents\\Tdocs\\RAN2\\RAN2_112-e\\R2-2009549.zip) is missing that the text is also executed at handover and RRC resume, in these cases the timer was stopped because of MAC reset. |
| OPPO | No to both CR | For nokia CR, no harm for the sentence there, due to we say“......,if running“  For samsung CR, nothinkg is broken and it is not necesary. |
| vivo | No strong view for 9549,  Disgree 9573 | For 9549, we cannot see any potential issue if keep the original text. |
| NEC | No strong view | For 9549, it seems the redundant, while no specific issue is seen, either. |
| CATT | Yes to 9549  No to 9573 | On 9549, it is better to remove the same duplication because of same behaviour captured in another agenda item.  For 9573, same view as ZTE. Since dormant BWP can only be configured for SCell, the current description is enough and will not casue any misunderstandings. |

[R2-2008927](file:///C:\\Users\\terhentt\\Documents\\Tdocs\\RAN2\\RAN2_112-e\\R2-2008927.zip) Correction on RA upon BWP switching to dormant BWP Asia Pacific Telecom co. Ltd CR Rel-16 38.321 16.2.1 0901 - F LTE\_NR\_DC\_CA\_enh-Core

CR wants to capture that the UE shall also abort the corresponding RA procedure in a case that the active DL BWP for the serving cell is switched to dormant BWP.

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| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | No | In our view 5.15.1 already indicates that UE does not perform RACH on dormant BWP thus we consider this is already clear. But technicall we don’t see anything wrong with the CR otherwise.  1> if a BWP is activated and the active DL BWP for the Serving Cell is dormant BWP:  …  2> not transmit on RACH on the BWP; |
| Qualcomm | No | From techinque perspective, we don’t think it is worth capturing it in spec:   * The only type of RACH procedure allowed in SCells are PDCCH order, which is initiated by Network. It is rather strange for a NW to first initiate a PDCCH order and then immediately switch that SCell to dormant BWP. * Thus, it is more like an corner case (if not error case), and so we don’t think it is worth capturing in the spec. |
| Asia Pacific Telecom (APT) | Yes | First of all, we would like to point out that the current behavior in MAC spec is not correct since it’s not reasonable for the UE to initiate a new RA procedure on a cell when switching to dormant BWP on that cell. This new ongoing RA procedure would be redundant in this case.  **To reply Nokia’s comment:**  In current 38.321, we also capture that the UE could not transmit on RACH on the SCell if the SCell is deactivated, and we clearly capture that the UE should abort the ongoing RA procedure even the UE could not transmit on RACH on this SCell.  NR 38.321  1> if the SCell is deactivated:  …  2> not transmit on RACH on the SCell;  …  When SCell is deactivated, the ongoing Random Access procedure on the SCell, if any, is aborted.  In fact, we consider the UE could not transmit on RACH is the reason why this change is needed. To follow the same logic as deactivated SCell case, we should revise the current behavior for dormant SCell case to avoid confusion.  **To reply Qualcomm’s comment:**  In LTE, we have a NOTE to capture that the UE should abort the ongoing RA procedure on an SCell when the SCell is in dormant state.  LTE 36.321  NOTE:    When SCell is in Dormant State, any ongoing Random Access procedure on the SCell is aborted.  From this perspective, we think this case indeed exists, so it’s better to align the same behavior in NR. |
| Samsung | No strong opinion | Regardless of having this CR, the intended behavior would be the same as before. |
| MediaTek | No strong view | We have same understanding that UE does not trigger RACH in dormant BWP. We assume that this is already somehow clear in current SPEC but would be fine to add the change if majorties support this. |
| ZTE | No strong view | We think the motivation of the CR is correct, and the wording seems fine. But we have some sympathy on QC’s comment, it is rare case that NW first triggers RACH and then triggers BWP switching immediately. Fine to go with majority. |
| Ericsson | Not needed | The proposed changes are technically correct, tough similar to Nokia and Qualcomm we don’t see a very strong need for the proposed changes, as it is covered already that the UE shall not transmit on RACH in dormant SCell. |
| Huawei | Yes | Agree with the intention.  The text proposed to be corrected seems to contradict with 5.15.1 indeed, then it is unclear what the UE requirement is in this scenario, even though that scenario might not be frequent. Thus a clear UE behavior in this case should be captured. |
| OPPO | No strong view | Agree with the intension, but it seems corner case and abnormal netowrk actions. |
| vivo | No | According to the below original text, MAC entity can avoid the UE to initiate a new RA procedure on a cell when switching to dormant BWP on that cell (see blue part).  *“Upon reception of the PDCCH for BWP switching other than successful contention resolution, if the MAC entity decides to perform BWP switching, the MAC entity shall stop the ongoing Random Access procedure and initiate a Random Access procedure after performing the BWP switching; if the MAC decides to ignore the PDCCH for BWP switching, the MAC entity shall continue with the ongoing Random Access procedure on the Serving Cell.*“  Even if MAC entity decides to perform BWP switching (see yellow part above), there is still no issue since the following procedure can ensure the RACH will not be transmitted.  1> if a BWP is activated and the active DL BWP for the Serving Cell is dormant BWP:  2> stop the *bwp-InactivityTimer* of this Serving Cell, if running.  2> not monitor the PDCCH on the BWP;  2> not monitor the PDCCH for the BWP;  2> not receive DL-SCH on the BWP;  2> not report CSI on the BWP, report CSI except aperiodic CSI for the BWP;  2> not transmit SRS on the BWP;  2> not transmit on UL-SCH on the BWP;  2> not transmit on RACH on the BWP;  2> not transmit PUCCH on the BWP.  2> clear any configured downlink assignment and any configured uplink grant Type 2 associated with the SCell respectively;  2> suspend any configured uplink grant Type 1 associated with the SCell;  2> if configured, perform beam failure detection and beam failure recovery for the SCell if beam failure is detected. |
| NEC | No strong view | we also think the CR does not change anything technically but fine to clarify if many companies want. |
| CATT | No strong view | We agree with Qualcomm. we wonder whether this case can occure, and it is also specify no RACH on dormant BWP. |

[R2-2010022](file:///C:\\Users\\terhentt\\Documents\\Tdocs\\RAN2\\RAN2_112-e\\R2-2010022.zip) Timing of direct SCell activation upon RRC configuration Ericsson CR Rel-16 38.321 16.2.1 0956 - F LTE\_NR\_DC\_CA\_enh-Core

The CR proposes to solve issues regarding direct scell activation timing by adding a reference to 38.133 for the direct SCell activation case, such that the reference to 38.213 applies only for the case of MAC CE activation

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| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | Maybe | We think this would be one way to remove any inclarities about timing. Alternatively RAN1 updates 38.213 to refer to 38.133. |
| Qualcomm | No strong view | This solution was discussed in RAN2#111-e. It was not agreed because some company mentioned 38.213 had a reference to 38.133, and thereby no need to capture a new reference in 38.321.  We think if 38.213 indeed had a referece to 38.133, then this CR is not needed. But we can follow majority. |
| Asia Pacific Telecom (APT) | No strong view | It may be better to update 38.213 since the timing for SCell activation/deactivation is captured in 38.213 section 4.3. |
| Samsung | Yes | It seems fine for clarity. |
| MediaTek | Maybe not | We don’t see strong need to have this. Anyway UE behavior should follow both 38.133 and 38.213 while applicalbe. |
| ZTE | No | We have different view on the “Reason for change“ in the cover page. This issue we discussed last meeting, is that for RRC signalling based SCell activation, due to RRC processing delay, how could network and UE have the same understanding about the start of sCellDeactivationTimer. In our view, this can not be simply solved by adding a reference to TS38.133. |
| Ericsson | Yes (proponent) | We think it would be best to solve this issue in RAN2, and it can be done with the change in the CR. A change in 38.213 would require RAN1 involvement, and since this relates to direct SCell activation case in RRC, the topic belongs in RAN2.  Regarding the comment from MediaTek, there is already a section 8.3.5 in TS38.133 for the timing requirements for direct SCell activation. |
| Huawei | Yes | Agree with the intention that the case of SCell activation via MAC CE should follow RAN1 spec, but the case of SCell activation via RRC message should only follow RAN4 requirment. However the the word "respectively" could be a little confusing, so we suggest to reword as below:  4> activate the SCell according to the timing defined in TS 38.213 [6] for the MAC CE activation and according to the timing defined in TS 38.133 [11] for direct SCell activation |
| OPPO | No | If we do so, if we change the MAC spce for all MAC CE command? |
| vivo | Yes | It seems fine for clarity. |
| NEC | No strong view | but, if applied, the wording from Huawei looks better. |
| CATT | Yes | It is better to clarify the corresponding timing methods respectively for different activation methods. |

[R2-2009550](file:///C:\\Users\\terhentt\\Documents\\Tdocs\\RAN2\\RAN2_112-e\\R2-2009550.zip) BWP support for dormancy Nokia, Nokia Shanghai Bell discussion Rel-16 LTE\_NR\_DC\_CA\_enh-Core

This paper considers about SCell dormancy and required BWP support capability basically saying that UE should support 2 dedicated BWPs in order to support SCell dormancy and that dormant BWPs are included in the BWP budget allowed by amount of supported BWPs.

NOTE: RAN1 is also discussing this so it might be good not to hurry for agreement but it would be good to get views on this one from RAN2 perspective (e.g. need to do any updates to 38.306?)

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| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | Yes (proponent) | Not much to add initially apart from what is in the paper. |
| Qualcomm | No | From technique perspective, this clarification will cause issue:   * Please note that SCell dormancy capability is **per-BC** but BWP capability is **per-band**. * Then, if BWP is a pre-requisite for SCell dormancy (i.e. if this CR agreed), it means if supporting SCell dormancy for a particular BC, then UE has to also support BWP switch for all the respective bands. For example, we have a BC with 3 bands (B1/B2 in FR1 and B3 in FR2), and the UE reports support dormancy for this BC where dormancy/non-dormancy transition is configured to only happen in B1 and B2. Then pre-requisite implies the UE has to also support BWP switch in B3. We think it is NOT an UE intended bevhavior.   Alternatively, we agree another clarification proposed by Nokia in their RAN1 contribution: **clarify that one dormant BWP and one non-dormant BWP are dedicated BWPs even for UEs not supporting both 6-2 and 6-3.** |
| Asia Pacific Telecom (APT) | No | We share the same concern as Qualcomm. It’s required to clarify the intended behavior for BC and the bands first. |
| Samsung | No | Similar view with Qualcomm. |
| MediaTek | See comment | We agree the intention but does not find the corepoding CR. Only change feature table does not change anything. We need to update the stage 3 TS. I did not follow the RAN1 discussion. But as QC indicate if there is already similar discussion in RAN1, we could wait for their conclusion. |
| ZTE | See comment | A little surprised. We thought proposal1 and proposal2 should be quite straightforward. But if this is under RAN1 discussion (as mentioned by others), we are fine to wait. |
| Ericsson | No | We share the concern of Qualcomm and think the dependency between 6-2 and 18-4 is something that RAN1 should discuss. In fact RAN1 is already discussing it, so we should not have the same discussion here. |
| Huawei | See comments | Agree with the intention, but better to wait for RAN1 progress first. |
| OPPO | See comments | Up to RAN1. |
| vivo | No | Agree with Qualcomm. |
| NEC |  | For p1 , maybe good to confirm the comments from QC in RAN2. For P2, given RAN1 can solve the issue by theirselves, it would be good to wait for RAN1 decision |
| CATT |  | Since RAN1 has already discuss this issue, it is better to wait for RAN1 progress. |

## 2.2 Early Measurement Reporting

### 2.2.1 Measurement validity

*Applicability to serving carrier measurements:*

[R2-2009551](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009551.zip) Measurement applicability and validity Nokia, Nokia Shanghai Bell CR Rel-15 36.331 15.11.0 4468 - F LTE\_euCA-Core

[R2-2009552](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009552.zip) Measurement applicability and validity Nokia, Nokia Shanghai Bell CR Rel-16 36.331 16.2.1 4469 - F LTE\_euCA-Core, LTE\_NR\_DC\_CA\_enh-Core

[R2-2009553](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2009553.zip) Measurement applicability and validity Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.2.0 2090 - F LTE\_NR\_DC\_CA\_enh-Core

First change reason:

1. When UE initialized idle mode measurements UE will perform measurements for each entry in *measIdleCarrierListEUTRA “*if UE supports carrier aggregation between serving carrier and the carrier frequency and bandwidth indicated by *carrierFreq* and *allowedMeasBandwidth* within the corresponding entry*”.* It may happen that after reselection UE would reselect to carrier which is listed in the *measIdleCarrierListEUTRA.* It is not so clear whether UE is actually now measuring serving frequency based on this (UE likely does not support “CA”between serving and serving frequency)*.* But we assume serving carrier should be also part of measured carriers..

Regarding first change in above CRs please provide your view:

|  |  |  |
| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | Yes (proponent) | As explained in the CR there is ambiquity in measuring serving frequency. This should be clarified. |
| Qualcomm | Yes | Serving carrier should always be measured. |
| Samsung | No | We don’t see the need of additional condition. |
| MediaTek | No | Don’t understand why we need measure serving cell **using the early measurement configuration**. Serving cell is always measured no matter EMR is configured or not accoruding to the cell reselection configuration. There is no need to report this in EMR. It is just not possible to be a SCell or PSCell anyway. |
| ZTE | No | Similar view as MTK, serving cell is always measured no matter EMR is configured or not. If only serving frequency is listed in the entry, then there is no need to report EMR, because it cannot be used for fast CA/DC setup. |
| Ericsson | No | To add that the UE shall also perform the idle/inactive measurements for the serving carrier, if it happens to be part of the idle/inactive measurement configuration, is a functional change. It goes against the earlier agreements that the UE only needs to perform early measurements for carriers for which the UE supports CA or DC with the serving frequency. We are not sure about the benefit for this specific case? The UE anyway needs to send measurement results for the serving cell but this proposed addition would be additional requirements for the UE since it then needs to perform early measurements for other cells on the same frequency. |
| Huawei | No | Share the same view as above companies.  This change is to add performing early measurement on serving frequency and storing/reporting the results. But we think the sentence in coversheet “But we assume serving carrier should be also part of measured carriers“ is not correct, because there is no use to report measurement results of non-serving cell on the serving frequency.  The serving cell is always be measured/evaluated for cell reselection, therefore the serving cell measurement results are always there to be incuded in early measurement report if needed. |
| OPPO | No | For the first change, I do not understand why we need this condition. |
| vivo | No | Measurement on serving carrier will be anyway performed, regardless of whether early configuration is configured. |
| NEC | No | same understanding as MediaTek |
| CATT | No | We have the same view as most companies. Serving cell is always measured for cell reselection and the measurement results of non-serving cell on the serving frequency is useless. |

Second change is reason for change is stated:

* When T331 expires UE will delete the *VarMeasIdleConfig* but it does not delete *VarMeasIdleReport.* UE will delete *VarMeasIdleReport* upon succesfull delivery of measurement results (in the UEInformationRequest procedure) or getting new configuration (RRC connection release). Looks that if the UE e.g. measured something and then remains in idle for 1h, it will still report last measured value. Or even: if UE once measured something in idle mode, it will store the result until some eNB with ask for it via UEInformationRequest, even e.g. if in the meantime it connected/disconnected to some/many other eNBs.

Regarding second change in above CRs please provide your view:

|  |  |  |
| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | Yes (proponent) | As explained in the CR if UE keeps measurements after T331 expiry and later reconnects to the NW (and possibly after having connected to eNBs which did not request UE to report idle mode measurements) UE could still report totally irrelevant measurements which could be very difficult in NW to see. |
| Qualcomm | No | * Deleting stored measurements after T331 expiry was specified in LTE Rel-15 euCA. Thus, it is NBC UE behavior, which will cause operability issues. * Even after T331 expiry, the measurement may still be useful, e.g. when UE doesn’t move in FR1 deployment. Then, this spec change will be an overkill. * Please note that one same note was capturd in 36.331/38.331:   “NOTE: It is up to UE implementation whether to continue IDLE mode measurements according to SIB5 configuration after T331 has expired or stopped.“  So, in some UE implementation, the UE will continue EMR after T331 expiry, e.g. perform measurement just before triggering RACH. Then this spec change will make these UE implementation not workable.  Based on above justifications, this change is not accpetable to us. |
| Samsung | No | We already discussed this issue several meetings ago. UE will report valid measurement results according to RAN4 requirements. |
| MediaTek | No | We have discussed this before and concluded that it should be leave to UE implementation. If something is needed, we prefer to say that UE shall delete this report if it choose NOT to continue the EMR after T331 timeout. But acually, we think nothing is really needed. |
| Ericsson | No | To delete the stored measurement results (VarMeasIdleReport) when T331 expires (or is stopped) would be a functional change. With this change no measurement results would be available in the cases where the UE performs RRC setup/resume after T331 has expired/been stopped, even if it is a limited time afterwards. It is true that it would mean that no such measurement results then would be reported a long time later (which can be an issue) but that issue would then still be there if the UE performs any early measurements after T331 has expired/been stopped (based on UE implementation). It would thus not (really) solve that issue anyway. In order to solve that issue it would instead be better to e.g. have a requirement for the UE to delete measurement results when they are too old. |
| Huawei | No | Agree with Qualcomm, Samsung and MediaTek, we do not need to repeat the discussion. |
| OPPO | No | For the second change, only the configuation will be removed when T331 expiries, not measurment results. Furthemore it is a stage 2 change, related function change. |
| vivo | No | Share same view with other companies. It should be left to UE implemetation. |
| NEC | No | we also understood this was discussed but left to UE implementation as far as the UE reports valid (not outdated) measurement results |
| CATT | No | We already discussed this issue before. In current spec, it is up to UE implementation whether continue to measure when the T331 timer expire. If the UE continues to measure, it seems unreasonable to delete measurement results at this time. On the other hand, it was agreed that do not support a mechanism to prevent outdated early measurement reporting in Rel-16 in RAN2#107 meeting, see the agreement below:  Agreement:  Do not support a mechanism to prevent outdated early measurement reporting in Rel-16 |

*Indication of T331 expiration in measurements:*

[R2-2010024](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010024.zip) Early measurement requirements Ericsson discussion LTE\_NR\_DC\_CA\_enh-Core

In the LS from RAN4 ([R4-2012297](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_96_e/Docs/R4-2012297.zip)) indicated that UE could continue measuring idle/inactive measurements after T331 expiry but NW would not be aware which requirements were applied. Thus it is proposed to indicate if measurements were done prior T331 expiry.

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| Company | Need for CR | Comments |
| Nokia | No | In our view it is not useful to continue to do measurements after T331 expiry and there is no need to inform NW about that. So easier would be just to stop those measurements. If the second change from CR set (R2-200951-200953) would be agreed then we would not have this problem as UE clear the varMeasIdleReport and there is no procedure to update that after T331 expiry. |
| Qualcomm | No | As we indicated before, it is UE implementation to ensure the reporting is valid even after T331 expires. We don't think it is helpful for NW to know whethet it is before or after T331 expires because how to handle it after T331 expires is up to UE implementation.  Even if 1-bit is reported to NW, we don’t think why NW can do better without knowing the details of UE implementation. |
| Samsung | No | It should be up to UE implementation as it was. UE will report vaild measurement results according to RAN4 requirements. |
| MediaTek | No | We don’t understand what’s the usage of this 1-bit indication for the NW. Does it imply that the NW will ignore the measurement result if UE indicates that it continues the EMR after T331 timeout ? |
| ZTE | No | Based on previous RAN2 conclusion, it is up to UE implementation how to ensure the validity of measurement results, if it is out-of-date, it is supposed be deleted by UE locally. |
| Ericsson | Yes (proponent) | Regarding Nokias comment: We have already agreed that any measurements performed after T331 expiry are left for UE implementation, so we should not change that agreement. Still, we believe it would be good for the network to receive some information about the measurements in order to determine the quality.  Regarding Qualcomms comment: With the proposed bit, at least the network will know the quality for measurements taken before T331 expiry. It true that after T331 expiry it is up to UE implementation, but also here network could gather statistics information per UE model to determine the accuracy. So we are not proposing to change the fact that after T331 expiry, the measurements are left to UE implementation. Just to provide the information to the network, whether the reported measurements were before T331 expiry or after.  Regarding Samsungs comment: The problem ist hat RAN4 did not specify how old measurements the UE can report.  Regarding MediaTeks comment: With the proposed bit, the network will be able to determine whether the measurements are from when T331 is running, with RAN4 requirements, or after T331 expiration, with no quality requirements, left for UE implementation. This will help network to determine the quality of the received measurements. Unfortunately, the RAN4 requirements did not specify how old the reported measurement are allowed to be.  Regarding MediaTeks comment: the problem ist hat RAN4 did not give any guidance as to what is “out of date“. |
| Huawei | No | Agree with Qualcomm and Samsung. RAN2 already agreed whether to continue performing early measurement is left to UE implementation. Do not see clear benifit to indicate network which requirement the UE is complying with as long as it meets RAN4 requirements. |
| OPPO | No | RAN2 agreed that continue performing early measurement is left to UE implementation. I understand the intesion, but I wonder how many UE will perfrom the meausrment after the timer expries? |
| vivo | No | What the network can do and its benefit for receiving this indication from the UE is not clear. |
| NEC | No | we do not see a need for this.. |
| CATT | No | We agree with the view of LG that this indication may be useful for the network, and it is an optimisation. However, it was agreed “Do not support a mechanism to prevent outdated early measurement reporting in Rel-16“ , if needed, it can be dicussed later. |

### 2.2.2 Storing of measurement results

*Clarification to IDLE mode measurement storing procedural text:*

[R2-2010023](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010023.zip) Serving cell results for early measurements Ericsson CR Rel-16 38.331 16.2.0 2162 - F LTE\_NR\_DC\_CA\_enh-Core

CR consider serving cell measurement reporting in early measurements and that e.g. in case only non serving cell inter-frequencies are configured UE would not store serving cell measurements at all.

Also CR claims UE may store serving cell measurements multiples times and that reportQuantity used for serving cell reporting is not clear.

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| Company | Need for CR | Comments |
| Nokia | Maybe | We consider that if CR is needed main motivation is to ensure that UE stores serving cell measurements even if only inter-frequencies are configured. Other problems stated in the CR do not seem to be that valid/critical. |
| Qualcomm | Yes | We support this CR. The UE behavior of current spec is not reasonable. |
| Samsung | No | If serving freq is not part of freqList, the UE is missing some configuration parameters e.g. which quantities to report, whether to perform beam reporting. Supporting serving reporting for this case requires defining how to handle such absence. Seems simpler (and sufficient) to just not report serving cell in such a case |
| MediaTek | Maybe not | The original text seems just asking UE to store the serving cell result **multiple times** in single serving cell result IE. The model may look a little bit strange but UE implemantion will anyway just report one serving cell result. We do not consider this as a must but fine to have this if majorites support. |
| ZTE | See comment | The motivation is ok, however, with this change, for serving cell measurement results, the paragraph of beam results sorting will be skipped, is that correct? |
| Ericsson | Yes (proponent) | The CR is needed to correct the UE behaviour to ensure serving cell measurements are reported correctly.  Regarding Nokias comment: The problem with the current procedural text for storing the EMR is that it loops through the entries in *measIdleCarrierListNR*:  3> for each entry in *measIdleCarrierListNR* within *VarMeasIdleConfig* that contains *ssb-MeasConfig*:  And then for each entry, it stores the serving cell results:  5> for all cells applicable for idle/inactive measurement reporting and for the serving cell, derive cell measurement results for the measurement quantities indicated by *reportQuantities;*  5> store the derived cell measurement results as indicated by *reportQuantities* for the serving cell within *measResultServingCell* in the *measReportIdleNR* in *VarMeasIdleReport*;  This means that the field for serving cell results will be written over and over again, per reported frequency, and then if *reportQuantities* differ per reported frequency, it is not clear which quantities are used in the end serving cell.  In 38.133 (4.4.2.3) it is specified that the UE shall measure both RSRP and RSRQ level of the serving cell.  Regarding ZTEs comment: According to current procedural text, the beam results sorting is not performed for serving cell. Only the line referring to serving cell is performed, since there is the following if statement to start:  4> if UE supports carrier aggregation or NR-DC between serving carrier and the carrier frequency and subcarrier spacing indicated by *carrierFreq* and *ssbSubCarrierSpacing* within the corresponding entry: |
| Huawei | No | For measurements in RRC\_CONNECTED, the UE is required to derive results for each measID, even if they are for the same measObject, but in practise, the UE wil derive results only once. This is the same for serving cell results here.  The motivation for the current EMR procedure is to e.g. not force the UE to derive RSRQ for the serving cell if RSRQ is not to be derived for any measured carrier.  Besides, the proposed changes do not include the beam results, while the current text will make them reported as below:  5> store the derived cell measurement results as indicated by *reportQuantities* for the serving cell within *measResultServingCell* in the *measReportIdleNR* in *VarMeasIdleReport*;  <...>  5> if *beamMeasConfigIdle* is included in the associated entry in *measIdleCarrierListNR*, for each cell in the measurement results:  The only "funny" aspect is that the sorting of serving cell beams may not be the same for each carrier, but we think it is not critical whichever sorting the UE will use. |
| OPPO | Yes |  |
| vivo | No | It seems 38.133 (4.4.2.3) only specified what quantities to be measured, but not specified what quantities to be reported. |
| NEC | No | according to the motivation in the cover page, we do not know why the serving NR cell measurements is necessary in this case (i.e. EMR only for EUTRA frequencies)? |
| CATT | Yes with comment | We agree with the intention of this CR, but the serving cell beams measurement results should also be included which seems not to be reflected in the current CR. In addition, the same question should be considered in 36.331. |

### 2.2.3 Usage of SIB indication

*Usage of SIB indication for early measurements:*

[R2-2010653](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010653.zip) Reporting of dle/inactive measurement not obtained in the current cell Huawei, HiSilicon CR Rel-16 36.331 16.2.1 4528 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2010654](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_112-e\R2-2010654.zip) Reporting of dle/inactive measurement not obtained in the current cell Huawei, HiSiliconf CR Rel-16 38.331 16.2.0 2268 - F LTE\_NR\_DC\_CA\_enh-Core

Change "these measurement results" to "stored EUTRA idle/inactive measurement results" or "stored NR idle/inactive measurement results"

In addition, for completeness, also capture that the two fields also control reporting the availability of stored idle/inactive measurement results

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| Company | Need for CRs | Comments |
| Nokia | Second change not OK,  First change is OK (but maybe not critical) | Technically first change seems tob editorial but makes wording slightly better in our view. But the sentence adding “ and is not required to report the availability of EUTRA idle/inactive measurement results.“ seems tob e unnecessary and even wrong as it seems to imply that it is up to UE implementation to indicate availability of measurements. |
| Qualcomm | Same view as Nokia | 1st is acceptable. 2nd is not necessary. |
| Samsung | Yes for the first change but No for the second change. | Fine with the first change but not necessary. But the second change is not needed because we already have the same condition for reporting availability in the procedural text. |
| MediaTek | Maybe not | First change is ok but not really eseential.  Second change is not needed as commented by Samsung. |
| ZTE | Prefer No | 1st change is editorial, for 2nd change is not needed as commented by others. And we actually did not see ambiguity issue of original wording. |
| Ericsson | Yes for the first change  No for the second change | The first change from “…these measurements…” to “…stored EUTRA idle/inactive measurement results…” (and similar for NR) makes it more clear, but this is an editorial change and can thus be included in the DCCA rapporteur miscellaneous correction CR. This is anyway how the sentence was supposed to be understood, i.e. the intention was not that the UE only indicates availability of measurements performed in the same cell. This is also already clear from the corresponding procedure text, e.g. in 5.3.3.4:  3> if the SIB2 contains *idleModeMeasurements* and the UE has E-UTRA idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*; or  3> if the SIB2 contains *idleModeMeasurementsNR* and the UE has NR idle/inactive measurement information available in *VarMeasIdleReport*:  4> include the *idleMeasAvailable*;  The proposed change is thus just an alignment with the procedure text.  For the second change, i.e. the addition “If absent, a UE is not required to perform EUTRA idle/inactive measurements and is not required to report the availability of EUTRA idle/inactive measurement results” (and similar for NR), we don‘t think that it makes sense to add this in the field descriptions. How the UE indicates availability (*idleMeasAvailable*) is already clearly specified in the related procedures (as the one above) and does not need to be added here as well. It would only cause a risk for ambiguities. |
| Huawei | Yes (proponent) | We think the 1st change is needed, because without the change, the UE will not report availablity and measurement results if the results were obtained when camping on the ealier cell, which is not the expected behaviour at all. |
| OPPO | Yes | Agree the intension and make the text more clear. |
| vivo | Agree 1st change, disagree 2st change. | Similar view with Nokia and Samsung. |
| NEC | Maybe not | only the first change is fine but seems not so necessary. |
| CATT | Yes for the first change  No for the second change | For the first change, we are fine with the change in CR to clear the measurement results also include the results that were obtained when camping on the ealier cell.  For the second change, it seems not necessary. |

# 3 Conclusion

**TO BE DONE 2nd MEETING WEEK MONDAY**

# 4 Contact Information

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