3GPP TSG-RAN WG2 Meeting #109bis-e draft R2-200xxxx

Online, 20 – 30 April 2020

**Agenda item: 4.2**

**Source: Huawei (offline email discussion rapporteur)**

**Title: Report [AT109bis-e][017][NR15] Cell Barred (Huawei)**

**Document for: Report**

# 1 Scope of the offline email discussion

This document contains the summary of the offline email discussion ”[AT109bis-e][017][NR15] Cell Barred (Huawei)” as indicated below:

* [AT109bis-e][017][NR15] Cell Barred (Huawei)

Scope: Treat R2-2003339, R2-2003773

Part 1: Determine which issues that need resolution, find agreeable proposals.

Deadline: April 23 0700 UTC

Part 2: For the parts that are agreeable, discussion will continue to agree on CRs.

# 2 Offline email discussion

[R2-2003339](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_109bis-e/Docs/R2-2003339.zip) Corrections to cell barred handling Huawei, HiSilicon CR Rel-15 38.304 15.6.0 0154 - F NR\_newRAT-Core

[R2-2003773](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_109bis-e/Docs/R2-2003773.zip) Corrections to cell barred handling Huawei, HiSilicon CR Rel-16 38.304 16.0.0 0155 1 A NR\_newRAT-Core

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

**Question 1: Do you agree with the intention of change 1 described in the CR?**

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| --- | --- | --- |
| **Company** | **Do you agree with the intention of change 1 the CR?** | **Detailed comments** |
| Qualcomm | **No** | In the existing specification, the UE shall follow the *intraFreqReselection* in *MIB* message when set to "not allowed". The change is actually not a correction and functional one as it now allows the UE to ignore this it can’t decode SIB1.  [In response to HW comment below]. I was confused with the indentation that the new “if” parts for the SIB were under the MIB indication. It seems the indentation is wrong (also the formatting of the original text). Then the change is even more confusing now that we repeat the SIB part twice.  If the may/shall is really a big problem, which I doubt since it has been there in LTE for a long time, we can just change “may” to “shall” for not acquiring SIB1 in the original text. You can also add the BW to the same clause and take care of second change. |
| Samsung | **No** | The current procedural text can be interpreted as what the CR tries to achieve i.e. there are two independent ‘if’ conditions. We think it can leave up to UE implementation as ‘may’ or ‘shall’ seems not essential in this case.  [In response to HW comment below]  For the 1st change, we understand that the intention is correct i.e. the first 'else' branch means the UE acquired MIB. So, IFRI bit in MIB will be applied anyway so there is indeed a conflicting UE requirement as you described. But as mentioned above, we still believe it is not essential/ real issue to be fixed. If the majority's preference is to fix it, the current CR seems quite messy. We think the simple option is to just change 'may' to 'shall' as follows:  If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1* or due to *trackingAreaCode* being absent in *SIB1* as specified in TS 38.331 [3]:  - The UE ~~may~~shall exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds. |
| Huawei |  | QC and Samsung comments seem technically incorrect.  Regarding QC comment, the change does not allow UE to ignore *intraFreqReselection* - with the change, UE first checks *intraFreqReselection* in MIB (UE only applies this “else” if UE has not failed due to failing to receive MIB – so UE must have the MIB) – then checks the failure reason and applies shall or may. So with the change, UE always checks the value of *intraFreqReselection* in MIB, or uses the value which 38.331 requires to consider (There are cases where 38.331 specifies what UE considers the value of *intraFreqReselection* to be)  [Responding to QC second comment]  See the updated notes on the CR, it tries to explain how the change works, and why it is not the same as LTE. Also see response to Ericsson below which should explain why we cannot just change “may” to “shall”.  [Responding to Ericsson comment below]  The problem is that the current specification requires the UE to bar the whole frequency for 300s. It can be the case where cells on the same frequency have a different bandwidth. The change does not allow the UE to reselect a non-best cell on that frequency – the change allows the UE to check whether there is a suitable cell on the same frequency with a supported bandwidth before the 300s \*(if the cell is best on the frequency according to cell reselection evaluation). This case “may” defines a maximum time for barring due to problems found in UMTS actually, where UEs were barring for too long for power saving, which prevented in some cases (e.g. country border) from finding service in a reasonable time – the same was propagated to LTE and now NR, because a similar deployment and hence problem is possible. It is better to have “may” for this case because the UE can then get back in service more quickly in certain deployments.  Regarding Samsung comment – there is a conflicting requirement in the spec – we can’t just leave to implementation without correcting the conflict. The proposed change does in fact leave it to UE implementation whether to bar for the full 300s or check earlier (“up to 300s”), so in fact the change accomodates Samsung’s proposal to leave to UE implementation, while also making this legitimate according to the specification, not leaving conflicting requirements in the specification. |
| Ericsson | **(No for now)** | 1. We had some problems to understand what the following sentence is trying to say that motivate the CR “*In case of not supporting the BW of cell the UE could check whether the BW used on other cells on this carrier before 300s expires and therefore “may” rather than “shall” should be applied for this case which needs expicit inclusion in 38.304 once the first correction is applied*”. 2. In case the UE does not support the BW of the cell, the UE shall re-select to another frequency, and not camp on a second strongest cell on that frequency, where the BW is supported. 3. We also think that the current 38.304 is clear on that aspect. |
| ZTE | **No** | We do not think may/shall is a big problem for this case. |
| CATT | **Yes but** | I understand the intention of the first change, try to explain as follows:  *else:*  *- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the SIB1 or due to trackingAreaCode being absent in SIB1 as specified in TS 38.331 [3]:*  *- The UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.*  *- If the field intraFreqReselection in MIB message is set to "allowed", the UE may select another cell on the same frequency if re-selection criteria are fulfilled;*  *- The UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.*  *- If the field intraFreqReselection in MIB message is set to "not allowed":*  In the current 38.304 spec, UE will check the highlighted green part before processing the highlighted yellow part, the problem is that UE can’t follow the highlighted green part before processing the highlighted yellow part, because anyway UE has already read MIB including IFRI and then the next step for UE is to check the highlighted green part, but the current text tells us that UE can make the decision to use ‘may’ only based on highlighted green part but ignoring the highlighted yellow part, this is a wrong UE behaviour.  We agree the intention, but the wording can be improved, so we give a version in the folder to address the intention of change 1 and change 2. |
| MediaTek | **Yes, but** | Current text still works as the UE will choose the “stronger” term, i.e. when UE sees “shall” and “may”, it takes “shall”. But we support this change as it clarifies UE behavior.  However, we think the “not supporte bandwidth” case should also be considered here, since this may happen when the the field intraFreqReselection in MIB message is set to "allowed". We would like to slightly modify the text (based on Huawei’s) as  If the field *intraFreqReselection* in *MIB* message is set to "allowed", the UE may select another cell on the same frequency if re-selection criteria are fulfilled;  - If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1* or due to *trackingAreaCode* being absent in *SIB1* or due to not supporting the *carrierBandwidth* in *SIB1*as specified in TS 38.331 [3]:  - The UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.  - else  - The UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds. |
| LG | **No** | If “may” and “shall” are applied together, we think it is up to UE implementation which requirement to follow. We could change “may” to “shall”, but we are afraid that the UE may fail to acquire SIB1 earlier than 300s. Therefore, we think it would be better to leave the current specification as it is. |

**Question 2: Do you agree with the intention of change 2 described in the CR?**

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| **Company** | **Do you agree with the intention of change 2 the CR?** | **Detailed comments** |
| Qualcomm | **Yes but** | Agree with the intention but should not be done together with first change. |
| Samsung | **No** | Our understanding is that if the UE does not support the BW of cell, the UE shall exclude the whole cells on the same frequency, which is aligned with the current RRC specification. So we think no change is needed. |
| Huawei |  | Correct that the current specification reuires that the UE bar the whole frequency for 300s, and this is what we think is undesirable because the UE may be able to find another suitale cell on the same frequency and should not be prevented from doing so. |
| Ericsson | **No** | We have the same understanding as Samsung, i.e. this is the current agreement and what is captured in the specification. The proposed CRs try to change this. We do not think the UE should camp on a second strongest cell, i.e. this may cause interference in the system when the UE tries to access. |
| ZTE | **No** | Following the existing description in 5.2.2.4.2, UE shall exclude the barred cell and the cells on the same frequency if UE does not support the BW of this cell.  In the CR, it is described that UE may exclude the barred cell and the cell on the same frequency if the UE does not support the BW of this cell, which is not consistent with the description in 38.331.  In addition, since a UE not able to support the BW in the cell will not change the capability suddenly, allowing UE to still have chance to check this cell or other cell on the same frequency may track UE in the same cell or frequency for a long time. We prefer to use “shall”. |
| CATT | **Yes but** | We think ‘UE does not support the bandwidth of cell’ is a valid case that should be addressed but is not addressed in the newest version of 38.304 at the moment, the problem of the proposed change is that this use case is not a sub-use case under “*If the field intraFreqReselection in MIB message is set to "not allowed":*”, the original procedure text in 38.331 is as follows:  *3> consider the cell as barred in accordance with TS 38.304 [20]; and*  *3> perform barring as if intraFreqReselection is set to notAllowed;*  The procedure text tells us no matter how the IFRI in MIB is set, the UE shall always treat IFRI as ‘*notAllowed*’, so the intention of change 2 is correct, but this new use case should not put under “*If the field intraFreqReselection in MIB message is set to "not allowed":*” branch.  so we give a version in the folder to address the intention of change 1 and change 2. |
| MediaTek | **Yes, but** | Similar to Q1, we support the change. However, the “the UE shall not re-select a cell on the same frequency as the barred cell” should be deleted as it confluict with later text. That is, we propose the following change based on Huawei’s text.  If the field *intraFreqReselection* in *MIB* message is set to "not allowed" ~~the UE shall not re-select a cell on the same frequency as the barred cell~~; |
| LG | **No** | We have same understanding with Samsung that it is already clear in 38.331 and do not want duplication in 331 and 304. |

# 3 Conclusions

**Conclusions:**

There is a mixture of opinions on both change 1 and change 2.

Change 1: 3 out of 8 (including proponent) companies support the intention,

Change 2: 4 out of 8 (including proponent) companies support the intention.

From company comments, there seems to be varying levels of interpretation/understanding on the current procedure text and the proposed changes, for both those supporting and not supporting the changes.

Given that there is currently not a consensus, but there is a level of support it is proposed to postpone the CR to the next meeting to give companies a chance to check their technical understanding.

**Proposal: CR postponed.**

# 4 List of referenced documents

1. [R2-2003339](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_109bis-e\Docs\R2-2003339.zip) Corrections to cell barred handling Huawei, HiSilicon CR Rel-15 38.304 15.6.0 0154 - F NR\_newRAT-Core
2. [R2-2003773](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_109bis-e\Docs\R2-2003773.zip) Corrections to cell barred handling Huawei, HiSilicon CR Rel-16 38.304 16.0.0 0155 1 A NR\_newRAT-Core