**3GPP TSG-RAN2 Meeting #126 *draft-*R2-2405939**

**Fukuoka, Japan, 20May – 24 May, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.304** | **CR** | **0381** | **rev** | **4** | **Current version:** |  |  |
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| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Introduction of barring exemption for (e)RedCap and 2RX XR UEs for emergency calls [EM\_Call\_Exemption] |
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| ***Source to WG:*** | Apple, China Telecom, Vodafone, Verizon, TMobile USA, ZTE, Vivo, Ericsson, Nokia |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | TEI18 |  | ***Date:*** | 05-09 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | It is not possible for a UE to make an emergency call if the cell is barred. A network may enable the access for eRedCap UEs in a cell, yet bar those UEs based on whether the eRedCap UE uses 1Rx or 2Rx branches. Similarly, a network may bar XR UEs based on whether the XR UE uses 2Rx or 4Rx branchesThe motivation for this functionality was to introduce control for the network on restriciting specific deviced from accessing the cell. This is done to avoid potential impact on, for example, performance.If the cell enables access for eRedCap UEs or XR UEs but the UEs consider this cell as barred based on the Rx branch support , it would be beneficial to introduce an exception for those UEs to have access to the cell to make an emergency call or receive emergency information broadcast when possible. |
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| ***Summary of change:*** | This CR introduces a mechanism to allow eRedCap or 2RX XR UEs to have access to the cell to make an emergency call or receive emergency information broadcast, when possible, if the cell enables access for eRedCap UEs or XR UEs but these UEs consider this cell as barred based on the rX branch support .The following logic is added to UE cell selection/re-selection procedure:If the cell supports eRedCap UEs but bars the eRedCap UEs due to only supporrting 1Rx or 2Rx branches, then the eRedcap UE can consider this as acceptable cell (for eg., for emergency calls), if the cell allows this by the relevant SIB1 IEs.If the cell supports XR UEs bars the 2Rx XR UEs due to only supporrting 2Rx branches, then the 2Rx XR UE can consider this as acceptable cell (for eg., for emergency calls).**Impact analysis**Impacted 5G architecture options:NR-SAImpacted functionality:Cell selection/reselection in IDLE mode and Emergency call functionalityInter-operability: If the UE is implemented with the CR while the NW is not, there is no inter-operability issue, as the UE cannot initiate an emergency call in such a case.If the NW is implemented with the CR while the UE is not, there is no inter-operability issue as the UE behaves as legacy device. |
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| ***Consequences if not approved:*** | An eRedCap UE cannot make emergency calls in a cell where access for eRedCap UEs is enabled but the eRedCap UEs with 1Rx or 2Rx branches are barred.An 2Rx XR UE cannot make emergency calls in a cell where the cell supports XR UEs but the 2Rx XR UEs are barred. |
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| ***Clauses affected:*** | 4.5, 5.3.1  |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |
|  |  |

## 4.5 Cell Categories

The cells are categorised according to which services they offer:

**acceptable cell:**

An "acceptable cell" is a cell on which the UE may camp to obtain limited service (originate emergency calls and receive ETWS and CMAS notifications). Such a cell shall fulfil the following requirements, which is the minimum set of requirements to initiate an emergency call and to receive ETWS and CMAS notification in an NR network:

- The cell is not barred, see clause 5.3.1 for details and exceptions;

- The cell selection criteria are fulfilled, see clause 5.2.3.2.

**suitable cell:**

For UE not operating in SNPN Access Mode, a cell is considered as suitable if the following conditions are fulfilled:

- The cell is part of either the selected PLMN or the registered PLMN or PLMN of the Equivalent PLMN list, and for that PLMN either:

- The PLMN-ID of that PLMN is broadcast by the cell with no associated CAG-IDs and CAG-only indication in the UE for that PLMN (TS 23.501 [10]) is absent or false;

- Allowed CAG list in the UE for that PLMN (TS 23.501 [10]) includes a CAG-ID broadcast by the cell for that PLMN;

- The cell selection criteria are fulfilled, see clause 5.2.3.2.

## *<<next change>>*

## 5.3 Cell Reservations and Access Restrictions

### 5.3.0 Introduction

There are two mechanisms which allow an operator to impose cell reservations or access restrictions. The first mechanism uses indication of cell status and special reservations for control of cell selection and reselection procedures. The second mechanism, referred to as Unified Access Control as specified in TS 38.331 [3], shall allow preventing selected access categories or access identities from sending initial access messages for load control reasons.

Unified Access Control does not apply to IAB-MTs and NCR-MTs.

### 5.3.1 Cell status and cell reservations

Cell status and cell reservations are indicated in the *MIB or SIB1* message as specified in TS 38.331 [3] by means of following fields:

- *cellBarred* (IE type: "barred" or "not barred")
Indicated in *MIB* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is ignored by UEs supporting NTN while *cellBarredNTN* is included in SIB1.

- *cellBarredNES* (IE type: "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to UEs capable of NES cell DTX/DRX.

- *cellBarred-eRedCap1Rx* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to eRedCap UEs.

- *cellBarred-eRedCap2Rx* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to eRedCap UEs.

- *cellBarredNTN* (IE type: "barred" or "not barred")
Indicated in SIB1 message. In case of multiple PLMNs indicated in *SIB1*, this field is common for all PLMNs. This field is ignored if the UE does not support NTN connectivity.

*- cellBarredATG* (IE type: "barred" or "not barred")
Indicated in SIB1 message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to ATG UEs.

- *cellBarredRedCap1Rx* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to RedCap UEs.

- *cellBarredRedCap2Rx* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to RedCap UEs.

- *cellBarredFixedVSAT* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs indicated in *SIB1*, this field is common for all PLMNs. This field is only applicable to VSAT UEs using NTN access.

- *cellBarredMobileVSAT* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs indicated in *SIB1*, this field is common for all PLMNs. This field is only applicable to VSAT UEs using NTN access.

- *cellBarredNES* (IE type: "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to UEs indicating any of the values in *nes-CellDTX-DRX* as specified in TS 38.306 [24].

- *cellBarredNTN* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs indicated in *SIB1*, this field is common for all PLMNs. This field is ignored if the UE does not support NTN access.

- *cellBarredRedCap1Rx* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to RedCap UEs.

- *cellBarredRedCap2Rx* (IE type: "barred" or "not barred")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to RedCap UEs.

- *cellReservedForOperatorUse* (IE type: "reserved" or "not reserved")
Indicated in *SIB1* message*.* In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is specified per PLMN or per SNPN.

- *cellReservedForOtherUse* (IE type: "true")
Indicated in *SIB1* message. In case of multiple PLMNs indicated in *SIB1*, this field is common for all PLMNs.

*- cellReservedForFutureUse* (IE type: "true")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs.

NOTE 0: IAB-MT ignores the *cellBarred*, *cellReservedForOperatorUse, cellReservedForFutureUse,* and *intraFreqReselection* (i.e. treats *intraFreqReselection* as if it was set to *allowed*) as defined in TS 38.331 [3]. IAB-MT also ignores *cellReservedForOtherUse* for cell barring determination (i.e. NPN capable IAB-MT considers *cellReservedForOtherUse* for determination of an NPN-only cell) as defined in TS 38.331 [3].

NOTE 0a: NCR-MT ignores the *cellBarred*, *cellReservedForOperatorUse, cellReservedForFutureUse,* and *intraFreqReselection* (i.e. treats *intraFreqReselection* as if it was set to *allowed*) as defined in TS 38.331 [3]. NCR-MT also ignores *cellReservedForOtherUse* for cell barring determination (i.e. NPN capable NCR-MT considers *cellReservedForOtherUse* for determination of an NPN-only cell) as defined in TS 38.331 [3].

- *halfDuplexRedCapAllowed* (IE type: "true")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. This field is only applicable to (e)RedCap UEs.

- *iab-Support* (IE type: "true")
Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is specified per PLMN or per SNPN.

- *ncr-Support* (IE type: "true")

Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs.

- *mobileIAB-Support* (IE type: “true”)

Indicated in *SIB1* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is specified per PLMN or per SNPN.

When cell status is indicated as "not barred" and "not reserved" for operator use and not "true" for other use and not "true" for future use,

- UEs shall treat this cell as candidate during the cell selection and cell reselection procedures.

When cell broadcasts any CAG-IDs or NIDs and the cell status is indicated as "not barred" and "not reserved" for operator use and "true" for other use, and not "true" for future use:

- All NPN-capable UEs shall treat this cell as candidate during the cell selection and cell reselection procedures, other UEs shall treat this cell as if cell status is "barred".

When cell status is indicated as "true" for other use, and either cell does not broadcast any CAG-IDs or NIDs or does not broadcast any CAG-IDs and the UE is not operating in SNPN Access Mode,

- The UE shall treat this cell as if cell status is "barred".

When cell status is indicated as "true" for future use,

- The UE shall treat this cell as if cell status is "barred".

When *cellBarredNES* is absent and *cellBarred* is set to"barred",

- The UE capable of NES cell DTX/DRX shall treat this cell as if cell status is "barred".

When *cellBarredNTN* is not broadcast in this cell,

- For NTN access, the UE shall treat this cell as if cell status is "barred".

When *halfDuplexRedCapAllowed* is not broadcast in this cell,

- The (e)RedCap UE only capable of operating in half-duplex for FDD shall treat this cell as if cell status is "barred".

When *cellBarredATG* is not broadcast in this cell,

- For ATG access, the UE shall treat this cell as if cell status is "barred".

When *cellBarredFixedVSAT* is not broadcast in this cell,

- For NTN access, the fixed VSAT UE shall treat this cell as if cell status is "barred".

When *cellBarredMobileVSAT* is not broadcast in this cell,

- For NTN access, the mobile VSAT UE shall treat this cell as if cell status is "barred".

When *cellBarred2RxXR* is broadcast in this cell,

- The 2Rx XR UE shall treat this cell as if cell status is "barred".

When cell status is indicated as "not barred" and "reserved" for operator use for any PLMN/SNPN and not "true" for other use and not "true" for future use,

- UEs assigned to Access Identity 11 or 15 operating in their HPLMN/EHPLMN shall treat this cell as candidate during the cell selection and reselection procedures if the field *cellReservedForOperatorUse* for that PLMN set to "reserved".

- UEs assigned to Access Identity 11 or 15 shall treat this cell as candidate during the cell selection and reselection procedures if the field *cellReservedForOperatorUse* for selected/registered SNPN is set to "reserved".

- UEs assigned to an Access Identity 0, 1, 2 and 12 to 14 shall behave as if the cell status is "barred" in case the cell is "reserved for operator use" for the registered PLMN/SNPN or the selected PLMN/SNPN.

- UEs assigned to Access Identity 3 shall behave as if the cell status is "barred" in case the cell is "reserved for operator use" for the registered PLMN or the selected PLMN.

NOTE 1: Access Identities 11, 15 are only valid for use in the HPLMN/ EHPLMN and registered/selected SNPN; Access Identities 12, 13, 14 are only valid for use in the home country and registered/selected SNPN as specified in TS 22.261 [12].

NOTE 1a: Access Identity 3 is only valid for PLMNs that indicate to potential Disaster Inbound Roamers that the UEs can access the PLMN as specified in TS 22.261 [12].

When cell status "barred" is indicated or to be treated as if the cell status is "barred",

- The UE is not permitted to select/reselect this cell, not even for emergency calls except for the below cases:

- When *cellBarred-eRedCap1Rx* is set to “barred” in SIB1, an eRedCap UE that supports only 1Rx branch can consider the cell as acceptable cell, only if cell selection criteria are fulfilled as defined in clause 5.2.3, *cellBarred* in MIB is not set to “barred” and in SIB1, *barringExemptEmergencyCall* is set to “true” and, if the eRedCap UE supports only half duplex FDD operation, *halfDuplex-eRedCapAllowed* is set to “true”; or

 - When *cellBarred-eRedCap2Rx* is set to “barred” in SIB1, an eRedCap UE that supports 2Rx branches can consider the cell as acceptable cell, only if cell selection criteria are fulfilled as defined in clause 5.2.3, *cellBarred* in MIB is not set to “barred” and in SIB1, *barringExemptEmergencyCall* is set to “true” and, if the eRedCap UE supports only half duplex FDD operation, *halfDuplex-eRedCapAllowed* is set to “true”; or

- When *cellBarred2RxXR* is present in SIB1, a 2Rx XR UE can consider the cell as acceptable cell, only if the cell selection criteria are fulfilled as defined in clause 5.2.3, *cellBarred* in MIB is not set to “barred” and in SIB1, *barringExemptEmergencyCall* is set to “true”;

- The UE shall select another cell according to the following rule:

- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *MIB*:

- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.

- the UE may select another cell on the same frequency if the selection criteria are fulfilled.

- else:

- If the UE is a RedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' to be '*intraFreqReselectionRedCap* in SIB1', if available;

- If the UE is an eRedCap UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' to be '*intraFreqReselection-eRedCap* in SIB1', if available;

- If the UE is a 2Rx XR UE, the UE shall acquire SIB1 and, in the remainder of this procedure, consider '*intraFreqReselection* in MIB' to be '*intraFreqReselection2RxXR* in SIB1', if available:

- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the SIB1:

- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.

- the UE may select another cell on the same frequency if the selection criteria are fulfilled.

- If the cell status "barred" is indicated in *MIB* but the UE is unable to acquire the SIB1; or

- If the cell is to be treated as if the cell status is "barred" due to not supporting (e)RedCap UEs; or

- If the cell is to be treated as if the cell status is "barred" due to not supporting 2Rx XR UEs:

- the UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.

- the UE may select another cell on the same frequency if re-selection criteria are fulfilled.

- If the UE is neither a RedCap UE nor an eRedCap UE nor a 2Rx XR UE, or if the UE is a RedCap UE and *intraFreqReselectionRedCap* in SIB1 is available, or if the UE is an eRedCap UE and *intraFreqReselection-eRedCap* in SIB1 is available, or if the UE is a 2Rx XR UE and *intraFreqReselection2RxXR* in SIB1 is available:

- 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*:

- 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.

- If the field *intraFreqReselection* in *MIB* message is set to "not allowed":

- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1*:

- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds;

- If the cell operates in licensed spectrum:

- the UE shall not re-select to another cell on the same frequency as the barred cell and exclude such cell(s) as candidate(s) for cell selection/reselection for 300 seconds;

- else:

- the UE may select to another cell on the same frequency if the reselection criteria are fulfilled.

- else:

- If the cell operates in licensed spectrum, or if this cell belongs to a PLMN which is indicated as being equivalent to the registered PLMN or the selected PLMN of the UE, or if this cell belongs to an SNPN which is equal to or indicated as being equivalent to the registered SNPN or the selected SNPN of the UE:

- the UE shall not re-select to another cell on the same frequency as the barred cell and exclude such cell(s) as candidate(s) for cell selection/reselection for 300 seconds;

- else:

- the UE may select to another cell on the same frequency if the reselection criteria are fulfilled.

- the UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.

The cell selection of another cell may also include a change of RAT.

NOTE 2: If barring of a cell is triggered by the condition of *trackingAreaCode* and *trackingAreaList* not being provided, as specified in TS 38.331 [3], the barring only applies to this PLMN and the UE can re-evaluate the barring condition again due to selection of another PLMN.

### 5.3.2 Unified access control

The information on cell access restrictions associated with Access Categories and Identities is broadcast in *SIB1* as part of Unified Access Control as specified in TS 38.331 [3].

The UE shall ignore Access Category and Identity related cell access restrictions for cell reselection. A change of the indicated access restriction shall not trigger cell reselection by the UE.

The UE shall consider Access Category and Identity related cell access restrictions for NAS initiated access attempts and RNAU as specified in TS 38.331 [3].

A L2 U2N Relay UE does not need to perform the Unified Access Control as specified in TS 38.331 [3], due to the U2N Remote UE access attempt.