**3GPP TSG-RAN WG2 #129bisR2-250xxxx**

**Malta, May 19th – 23st, 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **draftCR** | **rev** | **-** | **Current version:** | **18.5.1** |  |
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| *For* [***HE******LP***](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:***  | Running RRC CR for NR NTN phase 3 |
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| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_NTN\_Ph3-Core |  | ***Date:*** | 2025-05-02 |
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| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *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:*** | Introduction of Release 19 NR NTN phase 3 enhancements |
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| ***Summary of change:*** | This running CR captures the agreements of Solutions for NR to support non-terrestrial networks (NTN) in Release-19 from RAN2#129bis meeting. It will be maintained and updated as the WI progresses.Agreements considered for this running CR version:* If UE knows it's not in any intended service areas of any MBS services the UE is interested into, the UE may not need to acquire MCCH.
* The field warningAreaCoordinates is included in SIB6 while the field warningAreaCoordinatesSegment is included in SIB7 for ETWS primary/secondary notification to indicate Warning Area Coordinates IE.
* Introduce “warning area coordinates” in ETWS Primary Notification (SIB6) and in ETWS Secondary Notification (SIB7).
* In the new SIB, explicit network-indicated area ID is used to label an intended service area in the list
* It shall be possible to signal multiple service area IDs to one MBS service
* For an MBS broadcast service intended for a certain area, a R19 UE supporting the feature may initiate the broadcast MRB establishment procedure when UE is inside the intended area; the UE may initiate the broadcast MRB release procedure when UE leaves the intended area (capture this in stage 3)
* For each MBS service we include one or more intended service area IDs into MCCH.
* The encoding of TN coverage introduced in Rel-18 in TS38.331, including tn-ReferenceLocation-r18 and tn-DistanceRadius-r18, is reused for the geographical area of the circle.
* The encoding of Polygon in TS37.355 is reused for the geographical area of the Polygon.
* The IntendedServiceArea is considered as the IE name of the geographical area.
* Introduce a new SIB to include a list of intended service areas and related pointer.
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| ***Consequences if not approved:*** | No support for Release 19 NR NTN phase 3 enhancements. |
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| ***Clauses affected:*** | 5.2.2.4.7, 5.2.2.4.8, 5.2.2.4.XX, 5.9.1.1, 5.9.2.2, 5.9.3.2, 6.3.1 |
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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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

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| START OF CHANGE |

##### 5.2.2.4.7 Actions upon reception of *SIB6*

Upon receiving the *SIB6* the UE shall:

1> forward the received *warningType*, *messageIdentifier,* *serialNumber* and *warningAreaCoordinates* to upper layers;

##### 5.2.2.4.8 Actions upon reception of *SIB7*

Upon receiving the *SIB7* the UE shall:

1> if there is no current value for *messageIdentifier* and *serialNumber* for *SIB7*; or

1> if either the received value of *messageIdentifier* or of s*erialNumber,* or of both *messageIdentifier* and s*erialNumber* are different from the current values of *messageIdentifier* and *serialNumber* for *SIB7*:

2> use the received values of *messageIdentifier* and *serialNumber* for *SIB7* as the current values of *messageIdentifier* and *serialNumber* for *SIB7*;

2> discard any previously buffered *warningMessageSegment*;

2> discard any previously buffered *warningAreaCoordinatesSegment*;

2> if all segments of a warning message and geographical area coordinates (if any) have been received:

3> assemble the warning message from the received *warningMessageSegment(s)*;

3> assemble the geographical area coordinates from the received *warningAreaCoordinatesSegment* (if any);

3> forward the received warning message, *messageIdentifier*, *serialNumber*, *dataCodingScheme* and geographical area coordinates (if any) to upper layers;

3> stop reception of *SIB7*;

3> discard the current values of *messageIdentifier* and *serialNumber* for *SIB7*;

2> else:

3> store the received *warningMessageSegment*;

3> store the received *warningAreaCoordinatesSegment*;

3> continue reception of *SIB7*;

1> else if all segments of a warning message have been received:

2> assemble the warning message from the received *warningMessageSegment(s)*;

2> assemble the geographical area coordinates from the received *warningAreaCoordinatesSegment* (if any);

2> forward the received complete warning message, *messageIdentifier*, *serialNumber*, *dataCodingScheme* and geographical area coordinates (if any) to upper layers;

2> stop reception of *SIB7*;

2> discard the current values of *messageIdentifier* and *serialNumber* for *SIB7*;

1> else:

2> store the received *warningMessageSegment*;

2> store the received *warningAreaCoordinatesSegment*;

2> continue reception of *SIB7*;

The UE should discard any stored *warningMessageSegment* and *warningAreaCoordinatesSegment* (if any) and the associated values of *messageIdentifier* and *serialNumber* for *SIB7* if the complete warning message and the geographical area coordinates (if any) has not been assembled within a period of 3 hours.

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##### 5.2.2.4.XX Actions upon reception of *SIBXX*

No UE requirements related to the contents of *SIBXX* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/or within the corresponding field descriptions.

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#### 5.9.1.1 General

UE receiving or interested to receive MBS broadcast service(s) applies MBS broadcast procedures described in this clause as well as the MBS Interest Indication procedure as specified in clause 5.9.4. The UE may acquire MBS broadcast only if the UE can acquire it without disrupting unicast, SDT or MBS multicast data reception.

MBS broadcast configuration information, except CFR configuration for MCCH/MTCH, is provided on MCCH logical channel. MCCH carries the *MBSBroadcastConfiguration* message which indicates the MBS broadcast sessions that are provided in the cell as well as the corresponding scheduling related information for these sessions. Optionally, the *MBSBroadcastConfiguration* message may also contain a list of neighbour cells providing the same broadcast MBS service(s) as provided in the current cell. The configuration information required by the UE to receive MCCH is provided in *SIB1* and *SIB20*. Additionally, System Information may provide information related to service continuity of MBS broadcast in *SIB21* and information related to the intended service area of an MBS broadcast service in an NTN cell in *SIBXX*.

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#### 5.9.2.2 Initiation

A UE shall apply the MCCH information acquisition procedure upon becoming interested to receive MBS broadcast services. A UE interested to receive MBS broadcast services shall apply the MCCH information acquisition procedure upon entering the cell providing *SIB20* (e.g. upon power on, following UE mobility), upon receiving *SIB20* of an SCell via dedicated signalling and upon receiving a notification that the MCCH information has changed due to the start of new MBS service(s). A UE that is receiving data via broadcast MRB shall apply the MCCH information acquisition procedure upon receiving a notification that the MCCH information has changed due to MCCH information modification other than the change caused by the start of new MBS service(s).

NOTE 1: It is up to UE implementation how to address a possibility of the UE missing an MCCH change notification.

NOTE 2: It is up to UE implementation to use the cell/tracking area list in the USD or the intended service area information in SIBXX to avoid acquiring the MCCH when the UE is outside the MBS service area of the MBS broadcast service.

Unless explicitly stated otherwise in the procedural specification, the MCCH information acquisition procedure overwrites any stored MCCH information, i.e. delta configuration is not applicable for MCCH information and the UE discontinues using a field if it is absent in MCCH information.

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### 5.9.3 Broadcast MRB configuration

#### 5.9.3.1 General

The broadcast MRB configuration procedure is used by the UE to configure PDCP, RLC, MAC and the physical layer upon starting and/or stopping to receive a broadcast MRB transmitted on MTCH, or upon modification of a configuration of a broadcast MRB received by the UE. The procedure applies to MBS capable UEs that are interested to receive or that are receiving an MBS broadcast service that are in RRC\_IDLE, RRC\_INACTIVE or RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceMTCH* or *searchSpaceMCCH*.

NOTE: How to perform a modification of a broadcast MRB which is already configured in the UE is left to UE implementation.

#### 5.9.3.2 Initiation

The UE applies the broadcast MRB establishment procedure to start receiving an MBS session of an MBS broadcast service it is interested in. The procedure may be initiated e.g. upon start of the MBS session, upon entering a cell providing an MBS broadcast service the UE is interested in, upon becoming interested in the ongoing MBS broadcast service, upon removal of the UE capability limitations inhibiting reception of the ongoing MBS broadcast service UE is interested in, upon entering the intended service area for an MBS broadcast service the UE is interested in acquiring in an NTN cell.

The UE applies the broadcast MRB release procedure to stop receiving a session of an MBS broadcast service. The procedure may be initiated e.g. upon stop of the MBS session, upon leaving the cell broadcasting the MBS service the UE is interested in, upon losing interest in the MBS service, when capability limitations start inhibiting reception of the concerned service, upon leaving the intended service area for an MBS broadcast service the UE is interested in acquiring in an NTN cell.

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#### *– MBSBroadcastConfiguration*

The *MBSBroadcastConfiguration* message contains the control information applicable for MBS broadcast services transmitted via broadcast MRB.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH

Direction: Network to UE

*MBSBroadcastConfiguration message*

-- ASN1START

-- TAG-MBSBROADCASTCONFIGURATION-START

MBSBroadcastConfiguration-r17 ::= SEQUENCE {

 criticalExtensions CHOICE {

 mbsBroadcastConfiguration-r17 MBSBroadcastConfiguration-r17-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

MBSBroadcastConfiguration-r17-IEs ::= SEQUENCE {

 mbs-SessionInfoList-r17 MBS-SessionInfoList-r17 OPTIONAL, -- Need R

 mbs-NeighbourCellList-r17 MBS-NeighbourCellList-r17 OPTIONAL, -- Need S

 drx-ConfigPTM-List-r17 SEQUENCE (SIZE (1..maxNrofDRX-ConfigPTM-r17)) OF DRX-ConfigPTM-r17 OPTIONAL, -- Need R

 pdsch-ConfigMTCH-r17 PDSCH-ConfigBroadcast-r17 OPTIONAL, -- Need S

 mtch-SSB-MappingWindowList-r17 MTCH-SSB-MappingWindowList-r17 OPTIONAL, -- Need R

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension MBSBroadcastConfiguration-r19-IEs OPTIONAL

}

MBSBroadcastConfiguration-r19-IEs ::= SEQUENCE {

 mbs-SessionAreaMapping-r19 MBS-SessionAreaMapping-r19 OPTIONAL, -- Need R

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

MBS-SessionAreaMapping-r19 ::= SEQUENCE {

 mbs-SessionId-r19 TMGI-r17,

 mbs-AreaInfoList-r19 SEQUENCE (SIZE (1..maxNrofMBS-SessionPerArea-r19)) OF MBS-IntendedAreaID-r19

}

MBS-IntendedAreaID-r19 ::= INTEGER (0.. maxNrofMBS-Area-r19)

-- TAG-MBSBROADCASTCONFIGURATION-STOP

-- ASN1STOP

| *MBSBroadcastConfiguration* field descriptions |
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| ***pdsch-ConfigMTCH***Provides parameters for acquiring the PDSCH for MTCH. When this field is absent, the UE shall use parameters in *pdsch-ConfigMCCH* to acquire the PDSCH for MTCH. |
| ***mbs-SessionAreaMapping***Provides a list of intended service area identifiers, as defined in SIBXX, associated with a certain MBS broadcast session included in *mbs-SessionInfoList*. |
| ***mbs-SessionInfoList***Provides the configuration of each MBS session provided by MBS broadcast in the current cell. |
| ***mbs-NeighbourCellList***List of neighbour cells providing one or more MBS broadcast services via broadcast MRB that are provided by the current cell. This field is used by the UE together with *mtch-NeighbourCell* field signalled for each MBS session in the corresponding *MBS-SessionInfo*. When an empty *mbs-NeighbourCellList* list is signalled, the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell. When a non-empty *mbs-NeighbourCellList* is signalled, the current serving cell does not provide information about MBS broadcast services of a neighbour cell that is not included in *mbs-NeighbourCellList*, i.e., the UE cannot determine the presence or absence of an MBS service of a neighbour cell that is absent. When the field *mbs-NeighbourCellList* is absent, the current serving cell does not provide information about MBS broadcast services in the neighbouring cells, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. |

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*– SIB6*

*SIB6* contains an ETWS primary notification.

***SIB6* information element**

-- ASN1START

-- TAG-SIB6-START

SIB6 ::= SEQUENCE {

 messageIdentifier BIT STRING (SIZE (16)),

 serialNumber BIT STRING (SIZE (16)),

 warningType OCTET STRING (SIZE (2)),

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 ...,

 [[

 warningAreaCoordinates-r19 OCTET STRING OPTIONAL -- Need R

 ]]

}

-- TAG-SIB6-STOP

-- ASN1STOP

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| ***SIB6* field descriptions** |
| ***messageIdentifier***Identifies the source and type of ETWS notification. |
| ***serialNumber***Identifies variations of an ETWS notification. |
| ***warningAreaCoordinates***If present, carries the geographical area where the ETWS warning message is valid as defined in [29]. |
| ***warningType***Identifies the warning type of the ETWS primary notification and provides information on emergency user alert and UE popup. |

*– SIB7*

*SIB7* contains an ETWS secondary notification.

***SIB7* information element**

-- ASN1START

-- TAG-SIB7-START

SIB7 ::= SEQUENCE {

 messageIdentifier BIT STRING (SIZE (16)),

 serialNumber BIT STRING (SIZE (16)),

 warningMessageSegmentType ENUMERATED {notLastSegment, lastSegment},

 warningMessageSegmentNumber INTEGER (0..63),

 warningMessageSegment OCTET STRING,

 dataCodingScheme OCTET STRING (SIZE (1)) OPTIONAL, -- Cond Segment1

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 ...,

 [[

 warningAreaCoordinatesSegment-r19 OCTET STRING OPTIONAL -- Need R

 ]]

}

-- TAG-SIB7-STOP

-- ASN1STOP

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| ***SIB7* field descriptions** |
| ***dataCodingScheme***Identifies the alphabet/coding and the language applied variations of an ETWS notification. |
| ***messageIdentifier***Identifies the source and type of ETWS notification. |
| ***serialNumber***Identifies variations of an ETWS notification. |
| ***warningAreaCoordinatesSegment***If present, carries a segment, with one or more octets, of the geographical area where the ETWS warning message is valid as defined in [29]. The first octet of the first warningAreaCoordinatesSegment is equivalent to the first octet of Warning Area Coordinates IE defined in and encoded according to TS 23.041 [29] and so on. |
| ***warningMessageSegment***Carries a segment of the Warning Message Contents IE. |
| ***warningMessageSegmentNumber***Segment number of the ETWS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, A segment number of one corresponds to the second segment, and so on. |
| ***warningMessageSegmentType***Indicates whether the included ETWS warning message segment is the last segment or not. |

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| **Conditional Presence** | **Explanation** |
| *Segment1* | The field is mandatory present in the first segment of *SIB7*, otherwise it is absent. |

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#### – *SIBXX*

*SIBXX* contains the description of the intended service area of a broadcast service in an NTN cell.

*SIBXX* information element

-- ASN1START

-- TAG-SIBXX-START

SIBXX-r19 ::= SEQUENCE {

 intendedServiceAreaList-r19 IntendedServiceAreaList-r19 OPTIONAL, -- Need R

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 ...

}

IntendedServiceAreaList-r19 ::= SEQUENCE (SIZE (1.. maxNrofMBS-Area-r19)) OF IntendedServiceAreaInfo-r19

IntendedServiceAreaInfo-r19 ::= SEQUENCE {

 intendedServiceAreaId-r18 MBS-IntendedAreaID-r19,

 areaCoordinates-r19 CHOICE {

 polygonArea OCTET STRING,

 circleArea SEQUENCE {

 referenceLocation-r19 ReferenceLocation-r17,

 distanceRadius-r19 INTEGER(0..65535)

 }

 }

}

-- TAG-SIBXX-STOP

-- ASN1STOP

| *SIBXX* field descriptions |
| --- |
| ***IntendedServiceAreaList***Contains a list of intended service areas, each associated to one or more MBS broadcast services provided in a NTN cell. |
| ***polygonArea***Parameter type *Polygon* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |

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