**3GPP TSG-RAN4 Meeting #97-e *R4-20xxxxx***

**Online, , 2nd Nov 2020 - 13th Nov 2020**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.101-2** | **CR** | **0262** | **rev** | 1 | **Current version:** | **15.11.0** |  |
|  |
| *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 |  | Core Network |  |

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|  |
| ***Title:***  | EESS protection related requirements for FR2 bands  |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2020-11-06 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Introduction of EESS protection based on WRC-19. |
|  |  |
| ***Summary of change:*** | Introduction of NS\_203 and CA\_NS\_203 and relevant requirements.* Additional spurious emission
* A-MPR by referring to R4-2000216.
* ModifiedMPR by referring to approved WF of R4-2009141.

In addition, in order to make NS\_201 and CA\_NS\_201 not applicable by adding a NOTE. |
|  |  |
| ***Consequences if not approved:*** | NS\_203 cannot be implemented into UEs in a timely manner. |
|  |  |
| ***Clauses affected:*** | 6.2.3, 6.2A.3, 6.5.3.2, 6.5A.3.2, Annex H |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.521-2 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | [Isolated impact]UEs to reflect this CR content explictly signal newly supported requirements via modifiedMPR and network can differentiate UEs based on this CR and the legacy UEs. The network can appropriately treat these UEs based on the signalings. |
|  |  |
| ***This CR's revision history:*** |  |

< Start of changes>

### 6.2.3 UE maximum output power with additional requirements

#### 6.2.3.1 General

Additional emission requirements can be signalled by the network. Each additional emission requirement is associated with a unique network signalling (NS) value indicated in RRC signalling by an NR frequency band number of the applicable operating band and an associated value in the field additionalSpectrumEmission. Throughout this specification, the notion of indication or signalling of an NS value refers to the corresponding indication of an NR frequency band number of the applicable operating band (the IE field freqBandIndicatorNR) and an associated value of additionalSpectrumEmission in the relevant RRC information elements

To meet these additional requirements, additional maximum power reduction (A-MPR) is allowed for the maximum output power as specified in clause 6.2.1. Unless stated otherwise, an A-MPR of 0 dB shall be used.

Table 6.2.3.1-1 specifies the additional requirements with their associated network signalling values and the allowed A-MPR and applicable operating band(s) for each NS value. The mapping of NR frequency band numbers and values of and the *additionalSpectrumEmission* to network signalling labels is specified in Table 6.2.3.1-2. Unless otherwise stated, the allowed total back off is maximum of A-MPR and MPR specified in clause 6.2.2.

Table 6.2.3.1-1: Additional maximum power reduction (A-MPR)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Network Signalling label | Requirements (clause) | NR Band | Channel bandwidth (MHz) | Resources Blocks (*N*RB) | A-MPR (dB) |
| NS\_200 |  |  |  |  | N/A |
| NS\_2011 | 6.5.3.2.2 | n258 |  |  | 6.2.3.2 |
| NS\_202 | 6.5.3.2.3 | n257, n258 |  |  | 6.2.3.3 |
| NS\_203 | 6.5.3.2.4 | n258 |  |  | 6.2.3.4 |
| NOTE 1: NS\_201 is not applicable in the present release of specifications. |

Table 6.2.3.1-2: Mapping of Network Signaling label

|  |  |
| --- | --- |
| **NR Band** | **Value of additionalSpectrumEmission** |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| n257 | NS\_200 | NS\_202 |  |  |  |  |  |  |
| n258 | NS\_200 | NS\_2012 | NS\_202 | NS\_203 |  |  |  |  |
| n260 | NS\_200 |  |  |  |  |  |  |  |
| n261 | NS\_200 |  |  |  |  |  |  |  |
| NOTE 1: additionalSpectrumEmission corresponds to an information element of the same name defined in sub-clause 6.3.2 of TS 38.331 [13].NOTE 2: NS\_201 is not applicable in the present release of specifications. |

#### 6.2.3.2 Void

##### 6.2.3.2.1 Void

Table 6.2.3.2.1-1: (Void)

##### 6.2.3.2.2 Void

Table 6.2.3.2.2-1: (Void)

##### 6.2.3.2.3 Void

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Table 6.2.3.2.3-1: (Void)

##### 6.2.3.2.4 Void

#### 6.2.3.3 A-MPR for NS\_202

##### 6.2.3.3.1 A-MPR for NS\_202 for power class 1

For power class 1, A-MPR for NS\_202 shall be 11.0 dB.

##### 6.2.3.3.2 A-MPR for NS\_202 for power class 2

For power class 2, A-MPR for NS\_202 specified in clause 6.2.3.3.3 applies.

##### 6.2.3.3.3 A-MPR for NS\_202 for power class 3

For power class 3, A-MPR for NS\_202 shall be 1.0 dB.

##### 6.2.3.3.4 A-MPR for NS\_202 for power class 4

For power class 4, A-MPR for NS\_202 specified in clause 6.2.3.3.3 applies.

6.2.3.4 A-MPR for NS\_203

6.2.3.4.1 A-MPR for NS\_203 for power class 1

For power class 1, A-MPR for NS\_203 shall be 3.0 dB if Offset frequency < BWchannel, 0.0 dB otherwise.
The Offset frequency is defined as the frequency from 24.25 GHz to the lower edge of the channel bandwidth.

6.2.3.4.2 A-MPR for NS\_203 for power class 2

For power class 2, AMPR for NS\_203 specified in subclause 6.2.3.4.3 applies.

6.2.3.4.3 A-MPR for NS\_203 for power class 3

For power class 3, AMPR for NS\_203 shall be 0 dB.

6.2.3.4.4 A-MPR for NS\_203 for power class 4

For power class 4, AMPR for NS\_203 specified in subclause 6.2.3.4.3 applies.

< End of changes>

< Start of next changes>

### 6.2A.3 UE maximum output power with additional requirements for CA

#### 6.2A.3.1 General

Additional emission requirements can be signalled by the network with network signalling value indicated by the field *additionalSpectrumEmission.* To meet these additional requirements, additional maximum power reduction (A-MPR) is allowed for the maximum output power as specified in clause 6.2A.1. Unless stated otherwise, an A-MPR of 0 dB shall be used. Unless otherwise stated, the allowed total back off is maximum of A-MPR and MPR specified in clause 6.2A.2

For intra-band contiguous aggregation with the UE configured for transmissions on two serving cells, the maximum output power reduction specified in Table 6.2A.3.1-1 is allowed for all serving cells of the applicable uplink contiguous CA configurations according to the CA network signalling value indicated by the field *additionalSpectrumEmissionSCell*.

Table 6.2A.3.1-1 specifies the additional requirements and allowed A-MPR with corresponding network signalling label and operating band. The mapping between network signalling labels and the *additionalSpectrumEmission* IE defined in TS 38.331 [13] is specified in Table 6.2A.3.1-2. Unless otherwise stated, the allowed total back off is maximum of A-MPR and MPR specified in clause 6.2A.2.

Table 6.2A.3.1-1: Additional maximum power reduction (A-MPR)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Network Signalling value | Requirements (clause) | NR Band | Channel bandwidth (MHz) | Resources Blocks (*N*RB) | A-MPR (dB) |
| CA\_NS\_200 |  |  |  |  | N/A |
| CA\_NS\_2011 | 6.5.3.2.2 | n258 |  |  | 6.2A.3.2 |
| CA\_NS\_202 | 6.5.3.2.3 | n257, n258 |  |  | 6.2A.3.3 |
| CA\_NS\_203 | 6.5.3.2.4 | n258 |  |  | 6.2A.3.4 |
| NOTE 1: CA\_NS\_201 is not applicable in the present release of specifications. |

Table 6.2A.3.1-2: Value of additionalSpectrumEmission

|  |  |
| --- | --- |
| NR Band | Value of additionalSpectrumEmission / NS number |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| n257 | CA\_NS\_200 | CA\_NS\_202 |  |  |  |  |  |  |
| n258 | CA\_NS\_200 | CA\_NS\_2012 | CA\_NS\_202 | CA\_NS\_203 |  |  |  |  |
| n260 | CA\_NS\_200 |  |  |  |  |  |  |  |
| n261 | CA\_NS\_200 |  |  |  |  |  |  |  |
| NOTE 1: additionalSpectrumEmission corresponds to an information element of the same name defined in clause 6.3.2 of TS 38.331 [13].NOTE 2: CA\_NS\_201 is not applicable in the present release of specifications. |

#### 6.2A.3.2 Void

##### 6.2A.3.2.1 Void

Table 6.2A.3.2.1-1: (Void)

##### 6.2A.3.2.2 Void

Table 6.2A.3.2.2-1: (Void)

##### 6.2A.3.2.3 Void

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Table 6.2A.3.2.3-1: (Void)

##### 6.2A.3.2.4 Void

#### 6.2A.3.3 A-MPR for CA\_NS\_202

##### 6.2A.3.3.1 A-MPR for CA\_NS\_202 for power class 1

For intra-band contiguous CA, A-MPR for CA\_NS\_202 shall be 11.0 dB.

##### 6.2A.3.3.2 A-MPR for CA\_NS\_202 for power class 2

For intra-band contiguous CA, A-MPR for CA\_NS\_202 specified in sub-clause 6.2A.3.3.3 applies.

##### 6.2A.3.3.3 A-MPR for CA\_NS\_202 for power class 3

For intra-band contiguous CA, A-MPR for CA\_NS\_202 shall be 2.0 dB.

##### 6.2A.3.3.4 A-MPR for CA\_NS\_202 for power class 4

For intra-band contiguous CA, A-MPR for CA\_NS\_202 specified in sub-clause 6.2A.3.3.3 applies.

6.2A.3.4 A-MPR for CA\_NS\_203

6.2A.3.4.1 A-MPR for CA\_NS\_203 for power class 1

For intra-band contiguous CA, A-MPR for CA\_NS\_203 shall be 6.5 dB, if Offset frequency < frequency separation or BWChannel\_CA of the UL CA configuration, 0.0 dB, otherwise
The Offset frequency is defined as the frequency from 24.25 GHz to the lower edge of the lowest CC among the configured UL CA.

6.2A.3.4.2 A-MPR for CA\_NS\_203 for power class 2

For intra-band contiguous CA, AMPR specified in sub-clause 6.2A.3.4.3 applies.

6.2A.3.4.3 A-MPR for CA\_NS\_203 for power class 3

For intra-band contiguous CA, A-MPR for CA\_NS\_203 shall be 2.5 dB, if Offset frequency < frequency separation or BWChannel\_CA of the UL CA configuration, 0.0 dB otherwise.
The Offset frequency is defined as the frequency from 24.25 GHz to to the lower edge of the lowest CC among the configured UL CA.

6.2A.3.4.4 A-MPR for CA\_NS\_203 for power class 4

For intra-band contiguous CA, AMPR specified in sub-clause 6.2A.3.4.3 applies.

< End of changes>

< Start of next changes>

#### 6.5.3.2 Additional spurious emissions

##### 6.5.3.2.1 General

These requirements are specified in terms of an additional spectrum emission requirement. Additional spurious

emission requirements are signalled by the network to indicate that the UE shall meet an additional requirement for

a specific deployment scenario as part of the cell handover/broadcast message.

##### 6.5.3.2.2 Void

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Table 6.5.3.2.2-1: (Void)

##### 6.5.3.2.3 Additional spurious emission requirements for NS\_202

When "NS\_202" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5.3.2.3-1.

Table 6.5.3.2.3-1: Additional requirements (NS\_202)

|  |  |  |
| --- | --- | --- |
| **Frequency Range** | **Maximum Level** | **Measurement bandwidth** |
| 7.25 GHz ≤ f ≤ 2nd harmonic of the upper frequency edge of the UL operating band  | -10 dBm | 100 MHz |
| 23.6 GHz f 24.0 GHz | +1 dBm | 200 MHz |

6.5.3.2.4 Additional spurious emission requirements for NS\_203

When "NS\_203" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5.3.2.4-1. This requirement also applies for the frequency ranges that are less than FOOB (MHz) in Table 6.5.3-1 from the edge of the channel bandwidth.

**Table 6.5.3.2.4-1: Additional requirements (NS\_203)**

|  |  |  |
| --- | --- | --- |
| **Frequency band****(GHz)** | **Spectrum emission limit (dBm)** | **Measurement bandwidth**  |
| 23.6 f 24.0 | +1 | 200 MHz |

< End of changes>

< Start of next changes>

6.5A.3.2 Additional spurious emissions

6.5A.3.2.1 General

These requirements are specified in terms of an additional spectrum emission requirement. Additional spurious emission requirements are signalled by the network to indicate that the UE shall meet an additional requirement for a specific deployment scenario as part of the cell handover/broadcast message.

6.5A.3.2.2 Additional spurious emission requirements for CA\_NS\_201

When "CA\_NS\_201" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5.3.2.2-1. This requirement also applies for the frequency ranges that are less than FOOB (MHz) as defined in clause 6.5A.3.

6.5A.3.2.3 Additional spurious emission requirements for CA\_NS\_202

When "CA\_NS\_202" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5.3.2.3-1.

6.5A.3.2.4 Additional spurious emission requirements for CA\_NS\_203

When "CA\_NS\_203" is indicated in the cell, the power of any UE emission shall not exceed the levels specified in Table 6.5.3.2.4-1. This requirement also applies for the frequency ranges that are less than FOOB (MHz) as defined in section 6.5A.3.

< End of changes>

< Start of next changes>

# Annex H (Normative)

# Modified MPR behavior

# H.1 Indication of modified MPR behavior

This annex contains the definitions of the bits in the field *modifiedMPR-Behavior* indicated per supported NR band in the IE *RF-Parameters* [13] by a UE supporting an MPR or A-MPR modified in a given version of this specification. A modified MPR or A-MPR behaviour can apply to a supported NR band in stand-alone operation (including CA and NN-DC operation) or in non-standalone operation with the said NR band as part of an EN-DC or NE-DC band combination. Moreover, the bits in the field can explicitly indicate NS value(s) supported by a UE.

NOTE 1: In the present release, the *modifiedMPR-Behavior* is indicated [13] by an 8-bit bitmap per supported NR band.

Table H.1-1: Definitions of the bits in the field *modifiedMPRbehavior*

|  |  |  |  |
| --- | --- | --- | --- |
| NR Band | Index of field(bit number) | Definition(description of the supported functionality if indicator set to one) | Notes |
| n257 | 0 (leftmost bit) | - FR2 power class 3 MPR as defined in clause 6.2.2.3 of 38.101-2 v16.2.0 | - This bit may be set to 1 by a UE supporting n257 |
| n258 | 0 (leftmost bit) | - FR2 power class 3 MPR as defined in clause 6.2.2.3 of 38.101-2 v16.2.0 | - This bit may be set to 1 by a UE supporting n258 |
| 1 | - AMPR for NS\_201 as defined in clausue 6.2.3.2 of 38.101-2 v15.7.0 | - This bit may be set to 1 by a UE supporting n258 |
|  | 2 | - NS\_203 as defined in clause 6.5.3.2.4 or both NS\_203 and CA\_NS\_203 as defined in clause 6.5A.3.2.4 of 38.101-2 v15.11.0 | - This bit shall be set to 1 by a UE supporting n258 or both n258 and CA\_n258  |
| n260 | 0 (leftmost bit) | - FR2 power class 3 MPR as defined in clause 6.2.2.3 of 38.101-2 v16.2.0 | - This bit may be set to 1 by a UE supporting n260 |
| n261 | 0 (leftmost bit) | - FR2 power class 3 MPR as defined in clause 6.2.2.3 of 38.101-2 v16.2.0 | - This bit may be set to 1 by a UE supporting n261 |

< End of changes>