**3GPP TSG-RAN WG2 Meeting #111 Electronic *R2-2008215***

**17 – 28 August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.331** | **CR** |  | **rev** |  | **Current version:** | **16.1.0** |  |
|  | | | | | | | | |
| *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:*** | Corrections for NPNs | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Samsung, CATT, Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NG\_RAN\_PRN-Core, NR\_unlic-Core | | | | |  | ***Date:*** | | | 2020-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | 16 |
|  | *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 can be 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This CR contains the agreed NPN related corrections from RAN2#111-e. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. R2-2008016: Changes in the CR are endorsed 2. Update the name of IEs for indicating CAG-cell list per PLMN in SIB3 and SIB4 in a same manner. 3. R2-2006633: Changes 1) and 4) of the CR are endorsed: 4. Change “NPN-Identity” to “NPN identity” which is not an IE structure but only represents the first NPN ID in the list in section 5.2.2.2.1 5. Other editorial changes proposed in the CR 6. R2-2007842 7. The following change is endorsed: remove the reference to TS 23.501 for NPN identity in clause 5.2.2.2.1 8. R2-200. 9. A. 10. R2-200. 11. A. 12. R2-200. 13. A. 14. R2-200. 15. A.   **Impact analysis**  Impacted functionality:.  Inter-operability: | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The specification of NPN feature remains unclear and contains errors. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 5.2.2.2.1, 5.2.2.4.2, 6.3.1, 6.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*First Modified Subclause*

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**BH RLC channel:** The BH RLC channel consisting of an RLC and logical channel of an IAB-node.

**CEIL:** Mathematical function used to 'round up' i.e. to the nearest integer having a higher or equal value.

**DAPS bearer:** a bearer whose radio protocols are located in both the source gNB and the target gNB during DAPS handover to use both source gNB and target gNB resources.

**Dedicated signalling:** Signalling sent on DCCH logical channel between the network and a single UE.

**Dormant BWP:** The dormant BWP is one of downlink BWPs configured by the network via dedicated RRC signalling. In the dormant BWP, the UE stops monitoring PDCCH on/for the SCell, but continues performing CSI measurements, Automatic Gain Control (AGC) and beam management, if configured. For each serving cell other than the SpCell or PUCCH SCell, the network may configure one BWP as a dormant BWP.

**Field:** The individual contents of an information element are referred to as fields.

**FLOOR:** Mathematical function used to 'round down' i.e. to the nearest integer having a lower or equal value.

**Global cell id:** An identity to uniquely identifying an NR cell. It is consisted of *cellIdentity* and *plmn-Identity* of the first *PLMN-Identity* in *plmn-IdentityList* in SIB1.

**Information element:** A structural element containing single or multiple fields is referred as information element.

**NPN-only Cell**: A cell that is only available for normal service for NPNs' subscriber. An NPN-capable UE determines that a cell is NPN-only Cell by detecting that the *cellReservedForOtherUse* IE is set to true while the *npn-IdentityInfoList* IE is present in *CellAccessRelatedInfo*.

**NR sidelink communication**: AS functionality enabling at least V2X Communication as defined in TS 23.287 [55], between two or more nearby UEs, using NR technology but not traversing any network node.

**PNI-NPN identity:** an identifier of a PNI-NPN comprising of a PLMN ID and a CAG -ID combination.

[Omitted part]

*Next change*

##### 5.2.2.2.1 SIB validity

The UE shall apply the SI acquisition procedure as defined in clause 5.2.2.3 upon cell selection (e.g. upon power on), cell-reselection, return from out of coverage, after reconfiguration with sync completion, after entering the network from another RAT, upon receiving an indication that the system information has changed, upon receiving a PWS notification, upon receiving request (e.g., a positioning request) from upper layers; and whenever the UE does not have a valid version of a stored SIB or posSIB or a valid version of a requested SIB.

When the UE acquires a *MIB* or a *SIB1* or an SI message in a serving cell as described in clause 5.2.2.3, and if the UE stores the acquired SIB, then the UE shall store the associated *areaScope*, if present, the first *PLMN-Identity* in the *PLMN-IdentityInfoList* for non-NPN-only cells or the first NPN identity (SNPN identity in case of SNPN, or PNI-NPN identity in case of PNI-NPN) in the *npn-IdentityInfoList* for NPN-only cells, the *cellIdentity*, the *systemInformationAreaID*, if present, and the *valueTag*, if present, as indicated in the *si-SchedulingInfo* for the SIB. The UE may use a valid stored version of the SI except *MIB*, *SIB1*, *SIB6*, *SIB7* or *SIB8* e.g. after cell re-selection, upon return from out of coverage or after the reception of SI change indication. The value tag for posSIB is optionally provided in LPP signalling [49].

NOTE: The storage and management of the stored SIBs in addition to the SIBs valid for the current serving cell is left to UE implementation.

The UE shall:

1> delete any stored version of a SIB after 3 hours from the moment it was successfully confirmed as valid;

1> for each stored version of a SIB:

2> if the *areaScope* is associated and its value for the stored version of the SIB is the same as the value received in the *si-SchedulingInfo* for that SIB from the serving cell:

3> if the UE is NPN capable and the cell is an NPN-only cell and the first NPN identityincluded in the *npn-IdentityInfoList*, the *systemInformationAreaID* and the v*alueTag* that are included in the *si-SchedulingInfo* for the SIB received from the serving cell are identical to the NPN identity, the *systemInformationAreaID* and the *valueTag* associated with the stored version of that SIB:

4> consider the stored SIB as valid for the cell;

3> else if the first *PLMN-Identity* included in the *PLMN-IdentityInfoList*, the *systemInformationAreaID* and the v*alueTag* that are included in the *si-SchedulingInfo* for the SIB received from the serving cell are identical to the *PLMN-Identity*, the *systemInformationAreaID* and the *valueTag* associated with the stored version of that SIB:

4> consider the stored SIB as valid for the cell;

2> if the *areaScope* is not present for the stored version of the SIB and the *areaScope* value is not included in the *si-SchedulingInfo* for that SIB from the serving cell:

3> if the UE is NPN capable and the cell is an NPN-only cell and the first NPN identityin the *npn-IdentityInfoList,* the *cellIdentity* and *valueTag* that are included in the *si-SchedulingInfo* for the SIB received from the serving cell are identical to the NPN identity*,* the *cellIdentity* and the *valueTag* associated with the stored version of that SIB:

4> consider the stored SIB as valid for the cell;

3> else if the first *PLMN-Identity* in the *PLMN-IdentityInfoList,* the *cellIdentity* and *valueTag* that are included in the *si-SchedulingInfo* for the SIB received from the serving cell are identical to the *PLMN-Identity,* the *cellIdentity* and the *valueTag* associated with the stored version of that SIB:

4> consider the stored SIB as valid for the cell;

*Next change*

5.2.2.4.2 Actions upon reception of the *SIB1*

Upon receiving the *SIB1* the UE shall:

1> store the acquired *SIB1*;

1> forward the received *posSIB-MappingInfo* to upper layers, if included;

1> if the *cellAccessRelatedInfo* contains an entry with the *PLMN-Identity* of the selected PLMN:

2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *PLMN-IdentityInfo* containing the selected PLMN;

1> if the *cellAccessRelatedInfo* contains an entry of *npn-IdentityInfoList* with the NPN identity of the selected PLMN or SNPN:

2> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding entry of *npn-IdentityInfoList* containing the selected PLMN or SNPN;

1> if in RRC\_CONNECTED while T311 is not running:

2> disregard the *frequencyBandList*, if received, while in RRC\_CONNECTED;

2> forward the *cellIdentity* to upper layers;

2> forward the *trackingAreaCode* to upper layers;

2> apply the configuration included in the *servingCellConfigCommon*;

2> if the UE has a stored valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, that the UE requires to operate within the cell in accordance with sub-clause 5.2.2.1:

3> use the stored version of the required SIB;

2> else if the UE has an active BWP configured with common search space configured with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s), in accordance with sub-clause 5.2.2.1 or if requested by upper layers:

3> for the SI message(s) that, according to the *si-SchedulingInfo*, contain at least one required SIB and for which *si-BroadcastStatus* is set to *broadcasting*:

4> acquire the SI message(s) corresponding to the requested SIB(s) as defined in sub-clause 5.2.2.3.5;

3> for the SI message(s) that, according to the *si-SchedulingInfo*, contain at least one required SIB and for which *si-BroadcastStatus* is set to *notBroadcasting*:

4> trigger a request to acquire the required SIB(s) as defined in sub-clause 5.2.2.3.5;

3> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one requsted posSIB and for which *posSI-BroadcastStatus* is set to *broadcasting*:

4> acquire the SI message(s) corresponding to the requested posSIB(s) as defined in sub-clause 5.2.2.3.5;

3> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one requsted posSIB and for which *posSI-BroadcastStatus* is set to *notBroadcasting*:

4> trigger a request to acquire the requested posSIB(s) as defined in sub-clause 5.2.2.3.5;

NOTE: UE may include on demand request for SIB and/or posSIB(s) in the same message.

2> else if the UE has an active BWP not configured with common search space configured with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s), in accordance with sub-clause 5.2.2.1 or if requested by upper layers:

3> trigger a request to acquire the required SIB(s) as defined in sub-clause 5.2.2.3.5;

1> else:

2> if the UE supports one or more of the frequency bands indicated in the *frequencyBandList* for downlink for TDD, or one or more of the frequency bands indicated in the *frequencyBandList* for uplink for FDD, and they are not downlink only bands, and

2> if the UE supports at least one *additionalSpectrumEmission* in the *NR-NS-PmaxList* for a supported band in the downlink for TDD, or a supported band in uplink for FDD, and

2> if the UE supports an uplink channel bandwidth with a maximum transmission bandwidth configuration (see TS 38.101-1 [15] and TS 38.101-2 [39]) which

- is smaller than or equal to the *carrierBandwidth* (indicated in *uplinkConfigCommon* for the SCS of the initial uplink BWP), and which

- is wider than or equal to the bandwidth of the initial uplink BWP, and

2> if the UE supports a downlink channel bandwidth with a maximum transmission bandwidth configuration (see TS 38.101-1 [15] and TS 38.101-2 [39]) which

- is smaller than or equal to the *carrierBandwidth* (indicated in *downlinkConfigCommon* for the SCS of the initial downlink BWP), and which

- is wider than or equal to the bandwidth of the initial downlink BWP:

3> if *trackingAreaCode* is not provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list:

4> consider the cell as barred in accordance with TS 38.304 [20];

4> if *intraFreqReselection* is set to notAllowed:

5> consider cell re-selection to other cells on the same frequency as the barred cell as not allowed, as specified in TS 38.304 [20];

4> else:

5> consider cell re-selection to other cells on the same frequency as the barred cell as allowed, as specified in TS 38.304 [20];

3> else if UE is IAB-MT and if *iab-Support* is not provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list nor the selected SNPN nor the registered SNPN:

4> consider the cell as barred for IAB-MT in accordance with TS 38.304 [20];

3> else:

4> apply a supported uplink channel bandwidth with a maximum transmission bandwidth which

- is contained within the *carrierBandwidth* indicated in *uplinkConfigCommon* for the SCS of the initial uplink BWP, and which

- is wider than or equal to the bandwidth of the initial BWP for the uplink;

4> apply a supported downlink channel bandwidth with a maximum transmission bandwidth which

- is contained within the *carrierBandwidth* indicated in *downlinkConfigCommon* for the SCS of the initial downlink BWP, and which

- is wider than or equal to the bandwidth of the initial BWP for the downlink;

4> select the first frequency band in the *frequencyBandList*, for FDD from *frequencyBandList* for uplink, or for TDD from *frequencyBandList* for downlink,which the UE supports and for which the UE supports at least one of the *additionalSpectrumEmission* values in *nr-NS-PmaxList*, if present;

4> forward the *cellIdentity* to upper layers;

4> forward the *trackingAreaCode* to upper layers;

4> forward the PLMN identity or SNPN identity or PNI-NPN identity to upper layers;

4> if in RRC\_INACTIVE and the forwarded information does not trigger message transmission by upper layers:

5> if the serving cell does not belong to the configured *ran-NotificationAreaInfo*:

6> initiate an RNA update as specified in 5.3.13.8;

4> forward the *ims-EmergencySupport* to upper layers, if present;

4> forward the *eCallOverIMS-Support* to upper layers, if present;

4> forward the *uac-AccessCategory1-SelectionAssistanceInfo* to upper layers, if present;

4> apply the configuration included in the *servingCellConfigCommon*;

4> apply the specified PCCH configuration defined in 9.1.1.3;

4> if the UE has a stored valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, that the UE requires to operate within the cell in accordance with sub-clause 5.2.2.1:

5> use the stored version of the required SIB;

4> if the UE has not stored a valid version of a SIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s), in accordance with sub-clause 5.2.2.1:

5> for the SI message(s) that, according to the *si-SchedulingInfo*, contain at least one required SIB and for which *si-BroadcastStatus* is set to broadcasting:

6> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;

5> for the SI message(s) that, according to the *si-SchedulingInfo*, contain at least one required SIB and for which *si-BroadcastStatus* is set to *notBroadcasting*:

6> trigger a request to acquire the SI message(s) as defined in sub-clause 5.2.2.3.3;

4> if the UE has received request from upper layers:

5> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one requested posSIB and for which *posSI-BroadcastStatus* is set to *broadcasting*:

6> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;

5> for the SI message(s) that, according to the *posSI-SchedulingInfo*, contain at least one requested posSIB for which *posSI-BroadcastStatus* is set to *notBroadcasting*:

6> trigger a request to acquire the SI message(s) as defined in sub-clause 5.2.2.3.3a;

4> apply the first listed *additionalSpectrumEmission* which it supports among the values included in *NR-NS-PmaxList* within *frequencyBandList* in *uplinkConfigCommon* for FDD or in *downlinkConfigCommon* for TDD;

4> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NR-NS-PmaxList*:

5> apply the *additionalPmax* for UL;

4> else:

5> apply the *p-Max* in *uplinkConfigCommon* for UL;

4> if *supplementaryUplink* is present in *servingCellConfigCommon*; and

4> if the UE supports one or more of the frequency bands indicated in the *frequencyBandList* of supplementary uplink; and

4> if the UE supports at least one *additionalSpectrumEmission* in the *NR-NS-PmaxList* for a supported supplementary uplink band; and

4> if the UE supports an uplink channel bandwidth with a maximum transmission bandwith configuration (see TS 38.101-1 [15] and TS 38.101-2 [39]) which

- is smaller than or equal to the carrierBandwidth (indicated in supplementaryUplink for the SCS of the initial uplink BWP), and which

- is wider than or equal to the bandwidth of the initial uplink BWP of the SUL:

5> consider supplementary uplink as configured in the serving cell;

5> select the first frequency band in the *frequencyBandList* of supplementary uplink which the UE supports and for which the UE supports at least one of the *additionalSpectrumEmission* values in *nr-NS-PmaxList*, if present;

5> apply a supported supplementary uplink channel bandwidth with a maximum transmission bandwidth which

- is contained withn the carrierBandwidth (indicated in supplementaryUplink for the SCS of the initial uplink BWP), and which

- is wider than or equal to the bandwidth of the initial BWP of the SUL;

5> apply the first listed *additionalSpectrumEmission* which it supports among the values included in *NR-NS-PmaxList* within *frequencyBandList* for the *supplementaryUplink*;

5> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NR-NS-PmaxList* for the *supplementaryUplink*:

6> apply the *additionalPmax* in *supplementaryUplink* for SUL;

5> else:

6> apply the *p-Max* in *supplementaryUplink* for SUL;

2> else:

3> consider the cell as barred in accordance with TS 38.304 [20]; and

3> perform barring as if *intraFreqReselection* is set to *notAllowed*;

*Next change*

*Next change*

6.3.1 System information blocks

[Omitted part]

– *SIB3*

*SIB3* contains neighbouring cell related information relevant only for intra-frequency cell re-selection. The IE includes cells with specific re-selection parameters as well as blacklisted cells.

***SIB3* information element**

-- ASN1START

-- TAG-SIB3-START

SIB3 ::= SEQUENCE {

intraFreqNeighCellList IntraFreqNeighCellList OPTIONAL, -- Need R

intraFreqBlackCellList IntraFreqBlackCellList OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

intraFreqNeighCellList-v1610 IntraFreqNeighCellList-v1610 OPTIONAL, -- Need R

intraFreqWhiteCellList-r16 IntraFreqWhiteCellList-r16 OPTIONAL, -- Cond SharedSpectrum2

intraFreqCAG-CellList-r16 SEQUENCE (SIZE (1..maxPLMN)) OF IntraFreqCAG-CellListPerPLMN-r16 OPTIONAL -- Need R

]]

}

IntraFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo

IntraFreqNeighCellList-v1610::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo-v1610

IntraFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange,

q-RxLevMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

q-RxLevMinOffsetCellSUL INTEGER (1..8) OPTIONAL, -- Need R

q-QualMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

...

}

IntraFreqNeighCellInfo-v1610 ::= SEQUENCE {

ssb-PositionQCL-r16 SSB-PositionQCL-Relation-r16 OPTIONAL -- Cond SharedSpectrum2

}

IntraFreqBlackCellList ::= SEQUENCE (SIZE (1..maxCellBlack)) OF PCI-Range

IntraFreqWhiteCellList-r16 ::= SEQUENCE (SIZE (1..maxCellWhite)) OF PCI-Range

IntraFreqCAG-CellListPerPLMN-r16 ::= SEQUENCE {

plmn-IdentityIndex-r16 INTEGER (1..maxPLMN),

cag-CellList-r16 SEQUENCE (SIZE (1..maxCAG-Cell-r16)) OF PCI-Range

}

-- TAG-SIB3-STOP

-- ASN1STOP

| ***SIB3* field descriptions** |
| --- |
| ***intraFreqBlackCellList***  List of blacklisted intra-frequency neighbouring cells. |
| ***intraFreqCAG-CellList***  List of intra-frequency neighbouring CAG cells (as defined in TS 38.304 [20]) per PLMN. |
| ***intraFreqNeighCellList***  List of intra-frequency neighbouring cells with specific cell re-selection parameters. If *intraFreqNeighCellList-v1610* is present, it shall contain the same number of entries, listed in the same order as in *intraFreqNeighCellList* (without suffix). |
| ***intraFreqWhiteCellList***  List of whitelisted intra-frequency neighbouring cells, see TS 38.304 [20], clause 5.2.4. |
| ***q-OffsetCell***  Parameter "Qoffsets,n" in TS 38.304 [20]. |
| ***q-QualMinOffsetCell***  Parameter "Qqualminoffsetcell" in TS 38.304 [20]. Actual value Qqualminoffsetcell = field value [dB]. |
| ***q-RxLevMinOffsetCell***  Parameter "Qrxlevminoffsetcell" in TS 38.304 [20]. Actual value Qrxlevminoffsetcell = field value \* 2 [dB]. |
| ***q-RxLevMinOffsetCellSUL***  Parameter "QrxlevminoffsetcellSUL" in TS 38.304 [20]. Actual value QrxlevminoffsetcellSUL = field value \* 2 [dB]. |
| ***ssb-PositionQCL***  Indicates the QCL relationship between SS/PBCH blocks for a specific intra-frequency neighbor cell as specified in TS 38.213 [13], clause 4.1. If provided, the cell specific value overwrites the value signalled by *ssb-PositionQCL-Common* in *SIB2* for the indicated cell. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *SharedSpectrum2* | The field is optional present, Need R, if this intra-frequency or neighbor cell operates with shared spectrum channel access. Otherwise, it is absent, Need R. |

– *SIB4*

*SIB4* contains information relevant only for inter-frequency cell re-selection i.e. information about other NR frequencies and inter-frequency neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

***SIB4* information element**

-- ASN1START

-- TAG-SIB4-START

SIB4 ::= SEQUENCE {

interFreqCarrierFreqList InterFreqCarrierFreqList,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

interFreqCarrierFreqList-v1610 InterFreqCarrierFreqList-v1610 OPTIONAL -- Need R

}

InterFreqCarrierFreqList ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo

InterFreqCarrierFreqList-v1610 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1610

InterFreqCarrierFreqInfo ::= SEQUENCE {

dl-CarrierFreq ARFCN-ValueNR,

frequencyBandList MultiFrequencyBandListNR-SIB OPTIONAL, -- Cond Mandatory

frequencyBandListSUL MultiFrequencyBandListNR-SIB OPTIONAL, -- Need R

nrofSS-BlocksToAverage INTEGER (2..maxNrofSS-BlocksToAverage) OPTIONAL, -- Need S

absThreshSS-BlocksConsolidation ThresholdNR OPTIONAL, -- Need S

smtc SSB-MTC OPTIONAL, -- Need S

ssbSubcarrierSpacing SubcarrierSpacing,

ssb-ToMeasure SSB-ToMeasure OPTIONAL, -- Need S

deriveSSB-IndexFromCell BOOLEAN,

ss-RSSI-Measurement SS-RSSI-Measurement OPTIONAL,

q-RxLevMin Q-RxLevMin,

q-RxLevMinSUL Q-RxLevMin OPTIONAL, -- Need R

q-QualMin Q-QualMin OPTIONAL, -- Need S

p-Max P-Max OPTIONAL, -- Need S

t-ReselectionNR T-Reselection,

t-ReselectionNR-SF SpeedStateScaleFactors OPTIONAL, -- Need S

threshX-HighP ReselectionThreshold,

threshX-LowP ReselectionThreshold,

threshX-Q SEQUENCE {

threshX-HighQ ReselectionThresholdQ,

threshX-LowQ ReselectionThresholdQ

} OPTIONAL, -- Cond RSRQ

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need R

cellReselectionSubPriority CellReselectionSubPriority OPTIONAL, -- Need R

q-OffsetFreq Q-OffsetRange DEFAULT dB0,

interFreqNeighCellList InterFreqNeighCellList OPTIONAL, -- Need R

interFreqBlackCellList InterFreqBlackCellList OPTIONAL, -- Need R

...

}

InterFreqCarrierFreqInfo-v1610 ::= SEQUENCE {

interFreqNeighCellList-v1610 InterFreqNeighCellList-v1610 OPTIONAL, -- Need R

smtc2-LP-r16 SSB-MTC2-LP-r16 OPTIONAL, -- Need R

interFreqWhiteCellList-r16 InterFreqWhiteCellList-r16 OPTIONAL, -- Cond SharedSpectrum2

ssb-PositionQCL-Common-r16 SSB-PositionQCL-Relation-r16 OPTIONAL, -- Cond SharedSpectrum

interFreqCAG-CellList-r16 SEQUENCE (SIZE (1..maxPLMN)) OF InterFreqCAG-CellListPerPLMN-r16 OPTIONAL -- Need R

}

InterFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo

InterFreqNeighCellList-v1610 ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo-v1610

InterFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange,

q-RxLevMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

q-RxLevMinOffsetCellSUL INTEGER (1..8) OPTIONAL, -- Need R

...

}

InterFreqNeighCellInfo-v1610 ::= SEQUENCE {

ssb-PositionQCL-r16 SSB-PositionQCL-Relation-r16 OPTIONAL -- Cond SharedSpectrum2

}

InterFreqBlackCellList ::= SEQUENCE (SIZE (1..maxCellBlack)) OF PCI-Range

InterFreqWhiteCellList-r16 ::= SEQUENCE (SIZE (1..maxCellWhite)) OF PCI-Range

InterFreqCAG-CellListPerPLMN-r16 ::= SEQUENCE {

plmn-IdentityIndex-r16 INTEGER (1..maxPLMN),

cag-CellList-r16 SEQUENCE (SIZE (1..maxCAG-Cell-r16)) OF PCI-Range

}

-- TAG-SIB4-STOP

-- ASN1STOP

| ***SIB4* field descriptions** |
| --- |
| ***absThreshSS-BlocksConsolidation***  Threshold for consolidation of L1 measurements per RS index. If the field is absent, the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***deriveSSB-IndexFromCell***  This field indicates whether the UE may use the timing of any detected cell on that frequency to derive the SSB index of all neighbour cells on that frequency. If this field is set to *true*, the UE assumes SFN and frame boundary alignment across cells on the neighbor frequency as specified in TS 38.133 [14]. |
| ***dl-CarrierFreq***  This field indicates center frequency of the SS block of the neighbour cells, where the frequency corresponds to a GSCN value as specified in TS 38.101-1 [15]. |
| ***frequencyBandList***  Indicates the list of frequency bands for which the NR cell reselection parameters apply. |
| ***interFreqBlackCellList***  List of blacklisted inter-frequency neighbouring cells. |
| ***interFreqCAG-CellList***  List of inter-frequency neighbouring CAG cells (as defined in TS 38.304 [20] per PLMN. |
| ***interFreqCarrierFreqList***  List of neighbouring carrier frequencies and frequency specific cell re-selection information. If *iinterFreqCarrierFreqList-v1610* is present, it shall contain the same number of entries, listed in the same order as in *interFreqCarrierFreqList* (without suffix). |
| ***interFreqNeighCellList***  List of inter-frequency neighbouring cells with specific cell re-selection parameters. If *interFreqNeighCellList-v1610* is present, it shall contain the same number of entries, listed in the same order as in *interFreqNeighCellList* (without suffix). |
| ***interFreqWhiteCellList***  List of whitelisted inter-frequency neighbouring cells, see TS 38.304 [20], clause 5.2.4. |
| ***nrofSS-BlocksToAverage***  Number of SS blocks to average for cell measurement derivation. If the field is absent, the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***p-Max***  Value in dBm applicable for the neighbouring NR cells on this carrier frequency. If absent the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if *p-Max* is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39]. |
| ***q-OffsetCell***  Parameter "Qoffsets,n" in TS 38.304 [20]. |
| ***q-OffsetFreq***  Parameter "Qoffsetfrequency" in TS 38.304 [20]. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 38.304 [20]. If the field is absent, the UE applies the (default) value of negative infinity for Qqualmin. |
| ***q-QualMinOffsetCell***  Parameter "Qqualminoffsetcell" in TS 38.304 [20]. Actual value Qqualminoffsetcell = field value [dB]. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 38.304 [20]. |
| ***q-RxLevMinOffsetCell***  Parameter "Qrxlevminoffsetcell" in TS 38.304 [20]. Actual value Qrxlevminoffsetcell = field value \* 2 [dB]. |
| ***q-RxLevMinOffsetCellSUL***  Parameter "QrxlevminoffsetcellSUL" in TS 38.304 [20]. Actual value QrxlevminoffsetcellSUL = field value \* 2 [dB]. |
| ***q-RxLevMinSUL***  Parameter "Qrxlevmin" in TS 38.304 [20]. |
| ***smtc***  Measurement timing configuration for inter-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms in this frequency. |
| ***smtc2-LP-r16***  Measurement timing configuration for inter-frequency neighbour cells with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP-r16*. The timing offset and duration are equal to the offset and duration indicated in *smtc* in *InterFreqCarrierFreqInfo*. The periodicity in *smtc2-LP-r16* can only be set to a value strictly larger than the periodicity in *smtc* in *InterFreqCarrierFreqInfo* (e.g. if *smtc* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *smtc* indicates sf160, *smtc2-LP-r16* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the inter-frequency neighbour cells with Long Periodicity. If *smtc2-LP-r16* is absent, the UE assumes that there are no inter-frequency neighbour cells with a Long Periodicity. |
| ***ssb-PositionQCL***  Indicates the QCL relationship between SS/PBCH blocks for a specific neighbor cell as specified in TS 38.213 [13], clause 4.1. If provided, the cell specific value overwrites the common value signalled by *ssb-PositionQCL-Common* in *SIB4* for the indicated cell. |
| ***ssb-PositionQCL-Common***  Indicates the QCL relationship between SS/PBCH blocks for inter-frequency neighbor cells as specified in TS 38.213 [13], clause 4.1. |
| ***ssb-ToMeasure***  The set of SS blocks to be measured within the SMTC measurement duration (see TS 38.215 [9]). When the field is absent the UE measures on all SS-blocks. |
| ***ssbSubcarrierSpacing***  Subcarrier spacing of SSB. Only the values 15 kHz or 30 kHz (FR1), and 120 kHz or 240 kHz (FR2) are applicable. |
| ***threshX-HighP***  Parameter "ThreshX, HighP" in TS 38.304 [20]. |
| ***threshX-HighQ***  Parameter "ThreshX, HighQ" in TS 38.304 [20]. |
| ***threshX-LowP***  Parameter "ThreshX, LowP" in TS 38.304 [20]. |
| ***threshX-LowQ***  Parameter "ThreshX, LowQ" in TS 38.304 [20]. |
| ***t-ReselectionNR***  Parameter "TreselectionNR" in TS 38.304 [20]. |
| ***t-ReselectionNR-SF***  Parameter "Speed dependent ScalingFactor for TreselectionNR" in TS 38.304 [20]. If the field is absent, the UE behaviour is specified in TS 38.304 [20]. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *Mandatory* | The field is mandatory present in SIB4. |
| *RSRQ* | The field is mandatory present if *threshServingLowQ* is present in *SIB2*; otherwise it is absent. |
| *SharedSpectrum* | This field is mandatory present if this inter-frequency operates with shared spectrum channel access. Otherwise, it is absent, Need R. |
| *SharedSpectrum2* | The field is optional present, Need R, if this inter-frequency or neighbor cell operates with shared spectrum channel access. Otherwise, it is absent, Need R. |

[Omitted part]

– *SIB10*

*SIB10* contains the HRNNs of the NPNs listed in SIB1.

***SIB10* information element**

-- ASN1START

-- TAG-SIB10-START

SIB10-r16 ::= SEQUENCE {

hrnn-List-r16 HRNN-List-r16 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

HRNN-List-r16 ::= SEQUENCE (SIZE (1..maxNPN-r16)) OF HRNN-r16

HRNN-r16 ::= SEQUENCE {

hrnn-r16 OCTET STRING (SIZE(1.. maxHRNN-Len-r16)) OPTIONAL -- Need R

}

-- TAG-SIB10-STOP

-- ASN1STOP

|  |
| --- |
| ***SIB10* field descriptions** |
| ***hrnn-List***  The same amount of HRNN elements as the number of NPNs in SIB 1 are included. The n-th entry of *hrnn-List* contains the human readable network name of the n-th NPN of SIB1. The *hrnn* in the corresponding entry in *hrnn-List* is absent if there is no HRNN associated with the given NPN. |

[Omitted part]

*Next change*

### 6.3.2 Radio resource control information elements

[Omitted part]

#### – *CellAccessRelatedInfo*

The IE *CellAccessRelatedInfo* indicates cell access related information for this cell.

*CellAccessRelatedInfo* information element

-- ASN1START

-- TAG-CELLACCESSRELATEDINFO-START

CellAccessRelatedInfo ::= SEQUENCE {

plmn-IdentityList PLMN-IdentityInfoList,

cellReservedForOtherUse ENUMERATED {true} OPTIONAL, -- Need R

...,

[[

cellReservedForFutureUse-r16 ENUMERATED {true} OPTIONAL, -- Need R

npn-IdentityInfoList-r16 NPN-IdentityInfoList-r16 OPTIONAL -- Need R

]]

}

-- TAG-CELLACCESSRELATEDINFO-STOP

-- ASN1STOP

|  |
| --- |
| *CellAccessRelatedInfo* field descriptions |
| ***cellReservedForFutureUse***  Indicates whether the cell is reserved, as defined in 38.304 [20] for future use. The field is applicable to all PLMNs and NPNs. This field is ignored by IAB-MT. |
| ***cellReservedForOtherUse***  Indicates whether the cell is reserved, as defined in 38.304 [20]. The field is applicable to all PLMNs. This field is ignored by IAB-MT for cell barring determination, but still considered by NPN capable IAB-MT for determination of an NPN-only cell. |
| ***npn-IdentityInfoList***  The *npn-IdentityInfoList* is used to configure a set of *NPN-IdentityInfo* elements. Each of those elements contains a list of one or more NPN Identities and additional information associated with those NPNs. The total number of PLMNs (identified by a PLMN identity in *plmn -IdentityList*), PNI-NPNs (identified by a PLMN identity and a CAG-ID), and SNPNs (identified by a PLMN identity and a NID) together in the *PLMN-IdentityInfoList* and *npn-IdentityInfoList* does not exceed 12, except for the NPN-only cells. In case of NPN-only cells the *PLMN-IdentityList* contains a single element that does not count to the limit of 12. The NPN index is defined as *B+c1+c2+…+c(n-1)+d1+d2+…+d(m-1)+e(i)* for the NPN identity included in the *n*-th entry of *npn-IdentityInfoList* and in the *m*-th entry of *npn-Identitylist* within that *npn-IdentityInfoList* entry, and the *i*-th entry of its corresponding *npn-Identity*, where  - *B* is the index used for the last PLMN in the *PLMN-IdentittyInfoList*; in NPN-only cells *B* is considered 0;  - *c(j)* is the number of NPN index values used in the *j*-th *npn-IdentityInfoList* entry;  - *d(k)* is the number of NPN index values used in the *k*-th *npn-IdentityList* entry within the *n*-th *npn-IdentityInfoList* entry;  - e(i) is  - *i* if the *n*-th entry of *npn-IdentityInfoList* entry is for SNPN(s);  - 1 if the *n*-th entry of *npn-IdentityInfoList* entry is for PNI-NPN(s). |
| ***plmn-IdentityList***  The *plmn-IdentityList* is used to configure a set of *PLMN-IdentityInfoList* elements. Each of those elements contains a list of one or more PLMN Identities and additional information associated with those PLMNs. A PLMN-identity can be included only once, and in only one entry of the *PLMN-IdentityInfoList*. The PLMN index is defined as *b1+b2+…+b(n-1)+i* for the PLMN included at the *n*-th entry of *PLMN-IdentityInfoList* and the *i*-th entry of its corresponding *PLMN-IdentityInfo*, where *b(j)* is the number of *PLMN-Identity* entries in each *PLMN-IdentityInfo*, respectively. |

[Omitted part]

#### – *NPN-Identity*

The IE *NPN-Identity* includes either a list of CAG-IDs or a list of NIDs per PLMN Identity. Further information regarding how to set the IE is specified in TS 23.003 [21].

*NPN-Identity* information element

-- ASN1START

-- TAG-NPN-IDENTITY-START

NPN-Identity-r16 ::= CHOICE {

pni-npn-r16 SEQUENCE {

plmn-Identity-r16 PLMN-Identity,

cag-IdentityList-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF CAG-IdentityInfo-r16

},

snpn-r16 SEQUENCE {

plmn-Identity PLMN-Identity,

nid-List-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF NID-r16

}

}

CAG-IdentityInfo-r16 ::= SEQUENCE {

cag-Identity-r16 BIT STRING (SIZE (32)),

manualCAGselectionAllowed-r16 ENUMERATED {true} OPTIONAL -- Need R

}

NID-r16 ::= BIT STRING (SIZE (44))

-- TAG-NPN-IDENTITY-STOP

-- ASN1STOP

|  |
| --- |
| *NPN-Identity* field descriptions |
| ***cag-Identity***  A CAG-ID as specified in TS 23.003 [21]. The PLMN ID and a CAG ID in the *NPN-Identity* identifies a PNI-NPN. |
| ***cag-IdentityList***  The *cag-IdentityList* contains one or more CAG IDs. All CAG IDs associated to the same PLMN ID are listed in the same *cag-IdentityList* entry*.* |
| ***manualCAGselectionAllowed***  The *manualCAGselectionAllowed* indicates that the CAG ID can be selected manually even if it is outside the UE's allowed CAG list. |
| ***NID***  A NID as specified in TS 23.003 [21]. The PLMN ID and a NID in the *NPN-Identity* identifies a SNPN. |
| ***nid-List***  The *nid-List* contains one or more *NID*. A NID as specified in TS 23.003 [21]. The PLMN ID and a NID in the *NPN-Identity* identifies a SNPN. |

#### – *NPN-IdentityInfoList*

The IE *NPN-IdentityInfoList* includes a list of NPN identity information.

*NPN-IdentityInfoList* information element

-- ASN1START

-- TAG-NPN-IDENTITYINFOLIST-START

NPN-IdentityInfoList-r16 ::= SEQUENCE (SIZE (1..maxNPN-r16)) OF NPN-IdentityInfo-r16

NPN-IdentityInfo-r16 ::= SEQUENCE {

npn-IdentityList-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF NPN-Identity-r16,

trackingAreaCode-r16 TrackingAreaCode,

ranac-r16 RAN-AreaCode OPTIONAL, -- Need R

cellIdentity-r16 CellIdentity,

cellReservedForOperatorUse-r16 ENUMERATED {reserved, notReserved},

iab-Support-r16 ENUMERATED {true} OPTIONAL, -- Need R

...

}

-- TAG-NPN-IDENTITYINFOLIST-STOP

-- ASN1STOP

|  |
| --- |
| *NPN-IdentityInfoList* field descriptions |
| ***iab-Support***  This field combines both the support of IAB-node and the cell status for IAB-node. If the field is present, the cell supports IAB-nodes and the cell is also considered as a candidate for IAB-nodes; if the field is absent, the cell does not support IAB and/or the cell is barred for IAB-node. |
| ***NPN-IdentityInfo***  The *NPN-IdentityInfo* contains one or more NPN identities and additional information associated with those NPNs. Only the same type of NPNs (either SNPNs or PNI-NPNs) can be listed in a *NPN-IdentityInfo* element. |
| ***npn-IdentityList***  The *npn-IdentityList* contains one or more NPN Identity elements. Only the same type of NPNs (either SNPNs or PNI-NPNs) can be listed in a *npn-IdentityList*. |
| ***trackingAreaCode***  Indicates the Tracking Area Code to which the cell indicated by cellIdentity field belongs. |
| ***ranac***  Indicates the RAN Area Code to which the cell indicated by cellIdentity field belongs. |
| ***cellReservedForOperatorUse***  Indicates whether the cell is reserved for operator use (for the NPN(s) identified in the *npn-IdentityList*) as defined in TS 38.304 [20]. |

*End of Changes*