**3GPP TSG-RAN WG2 Meeting #109bis-e *R2-2005809***

**Electronic, 1 – 12 June 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **1513** | **rev** | **2** | **Current version:** |  |  |
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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:***  | Finalization of the support of Non-Public Networks |
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| ***Source to WG:*** | Nokia (Rapporteur) |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 2020-06 |
|  |  |  |  |  |
| ***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 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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | To complete the specification to support Non-Public Networks the new agreements from RAN2#109bis are needed to be implemented. |
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| ***Summary of change:*** | The following agreements from R2-2003895 are implemented:1. Follow the CT4 agreement on NID size in RRC specification
	1. In 6.3.2: NID-r16 size is changed from from 52 to 44 and “Editor's Note: The size of NID is to be checked based on CT4 agreements” is removed
2. TAC is “mandatory” within *NPN-IdentityInfoList*
	1. In 6.3.2 “Editor's Note: Whether trackingAreaCode is optinal or mandatory depends on DC/CA support. This is FFS.” Is removed
3. Use 48 octets (Option C) as the maximum size of HRNNs
	1. In 6.4 *maxHRNN-Len-r16* is defined as 48.

The following agreements from R2-2003896 are implemented:1. The PCI range(s) can be optionally signalled per PLMN and per frequency when the CAG cell is shared among different PLMNs (the changes also includes agreements from R2-2002745 and R2-2003907)
	1. In 6.3.1: *intraFreqCAG-CellList* in SIB3 and *interFreqCAG-CellList* in SIB4 are introduced
	2. In 6.4 *maxCAG-Cell* with FFSvalue is introduced
2. Reporting about the npn-IdentityInfoList is mandatory for all NPN-capable UEs, but optional for non-NPN capable UEs. Introduce a separate AS capability indication for NPN CGI reporting. This capability is conditionally mandatory for NPN-capable UEs
	1. In 5.5.5.1 CGI reporting is updated, “Editor's Note: It is FFS if all Rel-16 are required to be able to report the npn-IdentityInfoList” is removed

The following agreements from R2-2002745 are implemented:1. PCI ranges are signalled in SIB4
	1. See implemantation in 1) of R2-2003896

The following agreements from R2-2003907 are implemented:1. All cells including cells that do not support CAGs can optionally broadcast PCI ranges for CAGs per frequency per PLMN.
	1. See implemantation in 1) of R2-2003896
2. The validity time for PCI ranges advertised for CAGs is 3 hours (as for other SIB parameters).
	1. See implemantation in 1) of R2-2003896

The following agreements from R2-20057941. UAC parameter set for a PNI-NPN is selected based on the PLMN ID of PNI-NPNs. There is no need to broadcast CAG ID specific UAC parameter sets.
	1. " Editor's Note: A definition of network indexing for NPNs is FFS." Is removed
2. The PNI-NPNs belonging to the same PLMN have a common (shared) index value.
	1. *CellAccessRelatedInfo* with NPN indexing is updated and "Editor's Note: A definition of network indexing for NPNs is FFS." is removed.
	2. *RRCSetupComplete-IEs* field descriptions is updated
	3. *RRCResumeComplete-IEs* field descriptions is updated
3. Solution B (in R2-2005794, Section 2.5) will be used as baseline for indicating if it is allowed to manually select a CAG-ID supported by the CAG cell but outside the UE’s allowed CAG list.
	1. *manualCAGselectionAllowed-r16* is added into *NPN-Identity*
4. Include SIB10 in SI-SchedulingInfo using valueTags as for any other SIB (except SIB6,7,8) as proposed in Annex 2 of R2-2004690
	1. *SI-SchedulingInfo* is updated
5. RAN2 assumes that the CAG ID is never added to the RRCResumeComplete.
	1. Procedure description in 5.3.13.4 is updated (PLMN ID may come from the *NPN-IdentiyInfoList*

The following agreement from R2-2005804:1. The shared PLMN index value of PNI-NPNs belonging to the same PLMN ID is not shared with the index value for the PLMN with the same PLMN ID in the legacy PLMN list (i.e. there is a separate index value for PNI-NPNs belonging to the same PLMN).
	1. *CellAccessRelatedInfo* with NPN indexing is updated

The following comments from ASN.1 review (R2-2003309) are addressed1. I900: Section 5.2.2.2.1 SIB validity:“‘the first PLMN-Identity in the PLMN-IdentityInfoList for non-NPN-only cells, the first NPN-Identity (SNPN identity in case of SNPN, or PNI-NPN identity in case of PNI-NPN, see TS 23.501 [32]) in the NPN-IdentityInfoList for NPN-only cells,,’Since it is either the PLMN-identity or the NPN-Identity as the first identity, a ‘or’ is needed to make this clear”
	1. Section 5.2.2.2.1 is changed as proposed
2. Q001: Section 5.2.2.2.1 SIB validity:“These bullets are related to legacy behaviour, but addtion of this text somehow implies that the UE not supporting NPN needs to check if the cell is NPN-only cell. It is clear from the following defition in section 3.1 that only NPN capable UE can identify NPN-only cell. 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.”
	1. Section 5.2.2.2.1 is changed as proposed
3. Z101: 5.2.2.4.2 Actions upon reception of the SIB1“Since the upper layer will provide either a selected NPN or a selected PLMN to AS layer, there is no need for UE to differentiate between a NPN-only cell and a non NPN-only cell in this case.”
	1. Section 5.2.2.4.2 is changed as proposed
4. I901 5.5.5.1 General:“This is not aligned with the ASN. Where TAC is not optional.”
	1. Covered by 2) of R2-2003895
5. Z108: – SIB10“The entry should still be there but the hrnn-16 should be absent.”
	1. Description of hrnn-r16 is changed as proposed.
6. Z107: – NPN-Identity“The size of NID has been reduced to 44. See the latest CT4 CR (C4-200337).”
	1. Covered by 1) of R2-2003895
7. Z102: 5.2.2.4.2 Actions upon reception of the SIB1" There has been clear definition for selected PLMN in TS38.304 (see below) but there is no definition for selected NPN, we suggest to add one."
	1. Use the changes in Proposal 7 in R2-2005794 to address Z102
8. Z103: 5.2.2.4.2 Actions upon reception of the SIB1" There has been clear definition for registered PLMN in TS38.304 (see below) but there is no definition for registered NPN, we suggest to add one."
	1. Use changes in Proposal 8 of R2-2005794 to address Z103
9. I902 and I903: 5.3.3.4" It is not clear what ‘2> if upper layers selected a PLMN or an SNPN (TS 24.501 [23]):’ adds""This sentence is not completely correct"
	1. Use changes in Proposal 9 of R2-2005794 to address I902 and I903
10. H422: *NPN-IdentityInfoList* field descriptions" Duplicated field descriptions for TAC"
	1. Remove the duplicated field description as agreed in Proposal 13 of R2-2005794
11. H420: 5.2.2.4.1 Actions upon reception of the *MIB*" 1) The current text is inconsistent with 38.304 because the agreements on the IFR bit from NR-U and NPN are not embodied in the 38.331 text.2) "as the barred cell" is redundant and misleading"
	1. Proposed change is implemented in 5.2.2.4.1
12. H421: *UAC-BarringPerPLMN-List* field descriptions" The field description does not cover NPN cases.
	1. Proposed change is implemented in *UAC-BarringPerPLMN-List* field descriptions
13. Z112:"There has been clear definition for CAG cell TS38.304 (see below) but there is no definition in TS38.331, thus it is suggested to add reference to TS38.304"
	1. Proposed change is implemented in SIB3 and SIB4 field descriptions
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| ***Consequences if not approved:*** | The specification of support of Non-Public-Networks will not be complete. |
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| ***Clauses affected:*** | 3.1, 5.2.2.2.1, 5.2.2.4.1, 5.2.2.4.2, 5.3.3.4, 5.3.13.4, 5.5.5.1, 6.2.2, 6.3.1, 6.3.2, 6.4 |
|  |  |
|  | **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:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*First Modified Subclause*

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 a positioning request from upper layers; and whenever the UE does not have a valid version of a stored 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, see TS 23.501 [32]) 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-Identity* included 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-Identity* in 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 Modified Subclause*

#### 5.2.2.4 Actions upon receipt of System Information

##### 5.2.2.4.1 Actions upon reception of the *MIB*

Upon receiving the *MIB* the UE shall:

1> store the acquired *MIB*;

1> if the UE is in RRC\_IDLE or in RRC\_INACTIVE, or if the UE is in RRC\_CONNECTED while *T311* is running:

2> if the *cellBarred* in the acquired *MIB* is set to *barred*:

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

3> if *intraFreqReselection* is set to *notAllowed;* and

3> if the cell operates in licensed spectrum or the cell belongs to a PLMN which is indicated as being equivalent to the registered PLMN or the cell belongs to the registered SNPN of the UE:

4> 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].

3> else:

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

2> else:

3> apply the received *systemFrameNumber*, *pdcch-ConfigSIB1*, *subCarrierSpacingCommon*, *ssb-SubcarrierOffset* and *dmrs-TypeA-Position*.

*Next Modified Subclause*

5.2.2.4.2 Actions upon reception of the *SIB1*

Upon receiving the *SIB1* the UE shall:

1> store the acquired *SIB1*;

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 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 *NPN-IdentityInfo* 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 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:

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;

2> else if the UE has an active BWP not configured with common search space 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:

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> 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;

3> 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;

3> 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;

3> forward the *cellIdentity* to upper layers;

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:

4> forward the *trackingAreaCode* to upper layers;

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

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

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

5> initiate an RNA update as specified in 5.3.13.8;

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

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

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

3> apply the specified PCCH configuration defined in 9.1.1.3;

3> 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:

4> use the stored version of the required SIB;

3> 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:

4> 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:

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

4> 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*:

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

3> 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;

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

4> apply the *additionalPmax* for UL;

3> else:

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

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

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

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

3> 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:

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

4> 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;

4> 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;

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

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

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

4> else:

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

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

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

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 Modified Subclause*

5.3.3.4 Reception of the *RRCSetup* by the UE

The UE shall perform the following actions upon reception of the *RRCSetup*:

1> if the *RRCSetup* is received in response to an *RRCReestablishmentRequest*; or

1> if the *RRCSetup* is received in response to an *RRCResumeRequest* or *RRCResumeRequest1*:

2> discard any stored UE Inactive AS context and *suspendConfig*;

2> discard any current AS security context including the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key;

2> release radio resources for all established RBs except SRB0, including release of the RLC entities, of the associated PDCP entities and of SDAP;

2> release the RRC configuration except for the default L1 parameter values, default MAC Cell Group configuration and CCCH configuration;

2> indicate to upper layers fallback of the RRC connection;

2> stop timer T380, if running;

1> perform the cell group configuration procedure in accordance with the received *masterCellGroup* and as specified in 5.3.5.5;

1> perform the radio bearer configuration procedure in accordance with the received *radioBearerConfig* and as specified in 5.3.5.6;

1> if stored, discard the cell reselection priority information provided by the *cellReselectionPriorities* or inherited from another RAT;

1> stop timer T300, T301 or T319 if running;

1> if T390 is running:

2> stop timer T390 for all access categories;

2> perform the actions as specified in 5.3.14.4;

1> if T302 is running:

2> stop timer T302;

2> perform the actions as specified in 5.3.14.4;

1> stop timer T320, if running;

1> if the *RRCSetup* is received in response to an *RRCResumeRequest*, *RRCResumeRequest1* or *RRCSetupRequest*:

2> if T331 is running:

3> stop timer T331;

3> perform the actions as specified in 5.7.8.3;

2> enter RRC\_CONNECTED;

2> stop the cell re-selection procedure;

1> consider the current cell to be the PCell;

1> set the content of *RRCSetupComplete* message as follows:

2> if upper layers provide a 5G-S-TMSI:

3> if the *RRCSetup* is received in response to an *RRCSetupRequest*:

4> set the *ng-5G-S-TMSI-Value* to *ng-5G-S-TMSI-Part2*;

3> else:

4> set the *ng-5G-S-TMSI-Value* to *ng-5G-S-TMSI*;

2> set the *selectedPLMN-Identity* to the PLMN or SNPN selected by upper layers (TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* or the PLMN(s) or SNPN(s) included in the *npn-IdentityInfoList* in *SIB1*;

2> if upper layers provide the 'Registered AMF':

3> include and set the *registeredAMF* as follows:

4> if the PLMN identity of the 'Registered AMF' is different from the PLMN selected by the upper layers:

5> include the *plmnIdentity* in the *registeredAMF* and set it to the value of the PLMN identity in the 'Registered AMF' received from upper layers;

4> set the *amf-Identifier* to the value received from upper layers;

3> include and set the *guami-Type* to the value provided by the upper layers;

2> if upper layers provide one or more S-NSSAI (see TS 23.003 [21]):

3> include the *s-NSSAI-List* and set the content to the values provided by the upper layers;

2> set the *dedicatedNAS-Message* to include the information received from upper layers;

2> if connecting as an IAB-node:

3> include the *iab-NodeIndication*;

2> if the SIB1 contains *idleModeMeasurements* and the UE has idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*:

3> include the *idleMeasAvailable*;

2> if the UE has logged measurements available for NR and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable* in the *RRCSetupComplete* message;

2> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailableBT* in the *RRCSetupComplete* message;

2> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailableWLAN* in the *RRCSetupComplete* message;

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable* in the *RRCSetupComplete* message;

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable* in the *RRCSetupComplete* message;

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the UE is capable of cross-RAT RLF reporting and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]:

3> include *rlf-InfoAvailable* in the *RRCSetupComplete* message;

2> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

3> include the *mobilityHistoryAvail* in the *RRCSetupComplete* message;

2> include the *mobilityState* in the *RRCSetupComplete* message and set it to the mobility state (as specified in TS 38.304 [20]) of the UE just prior to entering RRC\_CONNECTED state;

1> submit the *RRCSetupComplete* message to lower layers for transmission, upon which the procedure ends.

*Next Modified Subclause*

5.3.13.4 Reception of the *RRCResume* by the UE

The UE shall:

1> stop timer T319;

1> stop timer T380, if running;

1> if T331 is running:

2> stop timer T331;

2> perform the actions as specified in 5.7.8.3;

1> if the *RRCResume* includes the *fullConfig*:

2> perform the full configuration procedure as specified in 5.3.5.11;

1> else:

2> if the *RRCResume* does not include the *restoreMCG-SCells*:

3> release the MCG SCell(s) from the UE Inactive AS context, if stored;

2> if the *RRCResume* does not include the *restoreSCG*:

3> if the UE is in NE-DC or NR-DC:

4> release the MR-DC related configurations (i.e., as specified in 5.3.5.10) from the UE Inactive AS context, if stored;

2> restore the *masterCellGroup, mrdc-SecondaryCellGroup*, if stored, and *pdcp-Config* from the UE Inactive AS context;

2> configure lower layers to consider the restored MCG and SCG SCell(s) (if any) to be in deactivated state;

1> discard the UE Inactive AS context;

1> release the *suspendConfig* except the *ran-NotificationAreaInfo*;

1> if the *RRCResume* includes the *masterCellGroup*:

2> perform the cell group configuration for the received *masterCellGroup* according to 5.3.5.5;

1> if the *RRCResume* includes the *mrdc-SecondaryCellGroup:*

2> if the received *mrdc-SecondaryCellGroup* is set to *nr-SCG*:

3> perform the RRC reconfiguration according to 5.3.5.3 for the *RRCReconfiguration* message included in *nr-SCG*;

2> if the received *mrdc-SecondaryCellGroup* is set to *eutra-SCG*:

3> perform the RRC connection reconfiguration as specified in TS 36.331 [10], clause 5.3.5.3 for the *RRCConnectionReconfiguration* message included in *eutra-SCG*;

1> if the *RRCResume* includes the *radioBearerConfig*:

2> perform the radio bearer configuration according to 5.3.5.6;

1> if the *RRCResume* message includes the *sk-Counter*:

2> perform security key update procedure as specified in 5.3.5.7;

1> if the *RRCResume* message includes the *radioBearerConfig2*:

2> perform the radio bearer configuration according to 5.3.5.6;

1> resume SRB2, SRB3 (if configured), and all DRBs;

1> if stored, discard the cell reselection priority information provided by the *cellReselectionPriorities* or inherited from another RAT;

1> stop timer T320, if running;

1> if the *RRCResume* message includes the *measConfig*:

2> perform the measurement configuration procedure as specified in 5.5.2;

1> resume measurements if suspended;

1> if T390 is running:

2> stop timer T390 for all access categories;

2> perform the actions as specified in 5.3.14.4;

1> if T302 is running:

2> stop timer T302;

2> perform the actions as specified in 5.3.14.4;

1> enter RRC\_CONNECTED;

1> indicate to upper layers that the suspended RRC connection has been resumed;

1> stop the cell re-selection procedure;

1> consider the current cell to be the PCell;

1> set the content of the of *RRCResumeComplete* message as follows:

2> if the upper layer provides NAS PDU, set the *dedicatedNAS-Message* to include the information received from upper layers;

2> if the upper layer provides a PLMN, set the *selectedPLMN-Identity* to PLMN selected by upper layers (TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* or in the *npn-IdentityInfoList* in *SIB1;*

2> if the *masterCellGroup* contains the *reportUplinkTxDirectCurrent*:

3> include the *uplinkTxDirectCurrentList* for each MCG serving cell with UL;

3> include *uplinkDirectCurrentBWP-SUL* for each MCG serving cell configured with SUL carrier, if any, within the *uplinkTxDirectCurrentList*;

2> if the UE has idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*:

3> if the *idleModeMeasurementReq* is included in the *RRCResume* message:

Editor's note: FFS if the *idleModeMeasuremnetReq* indicates all results (EUTRA and NR), or can request only NR results. The procedure below assumes the former.

4> set the *measResultIdleEUTRA* in the *RRCResumeComplete* message to the value of *measReportIdleEUTRA* in the *VarMeasIdleReport,* if available;

4> set the *measResultIdleNR* in the *RRCResumeComplete* message to the value of *measReportIdleNR* in the *VarMeasIdleReport*, if measurement information concerning cells other than the PCell is available;

4> discard the *VarMeasIdleReport* upon successful delivery of the *RRCResumeComplete* message is confirmed by lower layers;

3> else if the SIB1 contains *idleModeMeasurements*:

4> include the *idleMeasAvailable*;

2> if the *RRCResume* message includes the *mrdc-SecondaryCellGroupConfig* with *mrdc-SecondaryCellGroup* set to *eutra-SCG*:

3> include in the *eutra-SCG-Response* the E-UTRA *RRCConnectionReconfigurationComplete* message in accordance with TS 36.331 [10] clause 5.3.5.3;

2> if the *RRCResume* message includes the *mrdc-SecondaryCellGroupConfig* with *mrdc-SecondaryCellGroup* set to *nr-SCG*:

3> include in the *nr-SCG-Response* the SCG *RRCReconfigurationComplete* message;

2> if the UE has logged measurements available for NR and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable* in the *RRCResumeComplete* message*;*

2> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailableBT* in the *RRCResumeComplete* message;

2> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailableWLAN* in the *RRCResumeComplete* message;

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable* in the *RRCResumeComplete* message;

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable* in the *RRCResumeComplete* message;

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the UE is capable of cross-RAT RLF reporting and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]:

3> include *rlf-InfoAvailable* in the *RRCResumeComplete* message;

2> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

3> include the *mobilityHistoryAvail* in the *RRCResumeComplete* message;

2> include the *mobilityState* in the *RRCResumeComplete* message and set it to the mobility state (as specified in TS 38.304 [20]) of the UE just prior to entering RRC\_CONNECTED state;

1> submit the *RRCResumeComplete* message to lower layers for transmission;

1> the procedure ends.

*Next Modified Subclause*

### 5.3.14 Unified Access Control

#### 5.3.14.1 General

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [23] or the RRC layer.

After a PCell change in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained *SIB1* (as specified in 5.2.2.2) from the target cell.

#### 5.3.14.2 Initiation

Upon initiation of the procedure, the UE shall:

1> if timer T390 is running for the Access Category:

2> consider the access attempt as barred;

1> else if timer T302 is running and the Access Category is neither '2' nor '0':

2> consider the access attempt as barred;

1> else:

2> if the Access Category is '0':

3> consider the access attempt as allowed;

2> else:

3> if *SIB1* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN or SNPN selected by upper layers (see TS 24.501 [23]):

4> if the upper layers selected a PNI-NPN (identified by a PLMN identity and a CAG-ID) and *UAC-BarringPerPLMN* has an entry with the *plmn-IdentityIndex* corresponding to the PNI-NPN selected by upper layers:

5> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PNI-NPN selected by upper layers;

4> else:

5> select the *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN or to the SNPN selected by upper layers;

4> in the remainder of this procedure, use the selected *UAC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the *uac-BarringForCommon* included in *SIB1*;

3> else if SIB1 includes *uac-BarringForCommon*:

4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SIB1*;

3> else:

4> consider the access attempt as allowed;

3> if *uac-BarringForCommon* is applicable or the *uac-ACBarringListType* indicates that *uac-ExplicitACBarringList* is used:

4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:

5> select the *UAC-BarringPerCat* entry;

5> if the *uac-BarringInfoSetList* contains a *UAC-BarringInfoSet* entry corresponding to the selected *uac-barringInfoSetIndex* in the *UAC-BarringPerCat*:

6> select the *UAC-BarringInfoSet* entry;

6> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";

5> else:

6> consider the access attempt as allowed;

4> else:

5> consider the access attempt as allowed;

3> else if the *uac-ACBarringListType* indicates that *uac-ImplicitACBarringList* is used:

4> select the *uac-BarringInfoSetIndex* corresponding to the Access Category in the *uac-ImplicitACBarringList*;

4> if the *uac-BarringInfoSetList* contains the *UAC-BarringInfoSet* entry corresponding to the selected *uac-BarringInfoSetIndex*:

5> select the *UAC-BarringInfoSet* entry;

5> perform access barring check for the Access Category as specified in 5.3.14.5, using the selected *UAC-BarringInfoSet* as "UAC barring parameter";

4> else:

5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

3> if timer T302 is running:

4> if timer T390 is running for Access Category '2':

5> inform the upper layer that access barring is applicable for all access categories except categories '0', upon which the procedure ends;

4> else

5> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends.

*Next Modified Subclause*

5.5.5.1 General

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**Figure 5.5.5.1-1: Measurement reporting**

The purpose of this procedure is to transfer measurement results from the UE to the network. The UE shall initiate this procedure only after successful AS security activation.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

1> set the *measId* to the measurement identity that triggered the measurement reporting;

1> for each serving cell configured with *servingCellMO*:

2> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *rsType*:

3> if the serving cell measurements based on the *rsType* included in the *reportConfig* that triggered the measurement report are available:

4> set the *measResultServingCell* within *measResultServingMOList* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on the *rsType* included in the *reportConfig* that triggered the measurement report;

2> else:

3> if SSB based serving cell measurements are available:

4> set the *measResultServingCell* within *measResultServingMOList* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on SSB;

3> else if CSI-RS based serving cell measurements are available:

4> set the *measResultServingCell* within *measResultServingMOList* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on CSI-RS;

1> set the *servCellId* within *measResultServingMOList* to include each NR serving cell that is configured with *servingCellMO*, if any;

1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport*:

2> for each serving cell configured with *servingCellMO*, include beam measurement information according to the associated *reportConfig* as described in 5.5.5.2;

1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:

2> for each *measObjectId* referenced in the *measIdList* which is also referenced with *servingCellMO*, other than the *measObjectId* corresponding with the *measId* that triggered the measurement reporting:

3> if the *measObjectNR* indicated by the *servingCellMO* includes the RS resource configuration corresponding to the *rsType* indicated in the *reportConfig*:

4> set the *measResultBestNeighCell* within *measResultServingMOList* to include the *physCellId* and the available measurement quantities based on the *reportQuantityCell* and *rsType* indicated in *reportConfig* of the non-serving cell corresponding to the concerned *measObjectNR* with the highest measured RSRP if RSRP measurement results are available for cells corresponding to this *measObjectNR*, otherwise with the highest measured RSRQ if RSRQ measurement results are available for cells corresponding to this *measObjectNR*, otherwise with the highest measured SINR;

4> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport:*

5> for each best non-serving cell included in the measurement report:

6> include beam measurement information according to the associated *reportConfig* as described in 5.5.5.2;

1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *eventTriggered* and *eventID* is set to *eventA3*, or *eventA4*, or *eventA5*, or *eventB1*, or *eventB2*:

2> if the UE is in NE-DC and the measurement configuration that triggered this measurement report is associated with the MCG:

3> set the *measResultServFreqListEUTRA-SCG* to include an entry for each E-UTRA SCG serving frequency with the following:

4> include *carrierFreq* of the E-UTRA serving frequency;

4> set the *measResultServingCell* to include the available measurement quantities that the UE is configured to measure by the measurement configuration associated with the SCG;

4> if *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:

5> set the *measResultServFreqListEUTRA-SCG* to include within *measResultBestNeighCell* the quantities of the best non-serving cell, based on RSRP, on the concerned serving frequency;

1> if *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *eventTriggered* and *eventID* is set to *eventA3*, or *eventA4*, or *eventA5*:

2> if the UE is in NR-DC and the measurement configuration that triggered this measurement report is associated with the MCG:

3> set the *measResultServFreqListNR-SCG* to include for each NR SCG serving cell that is configured with *servingCellMO*, if any, the following:

4> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *rsType*:

5> if the serving cell measurements based on the *rsType* included in the *reportConfig* that triggered the measurement report are available according to the measurement configuration associated with the SCG:

6> set the *measResultServingCell* within *measResultServFreqListNR-SCG* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on the *rsType* included in the *reportConfig* that triggered the measurement report;

4> else:

5> if SSB based serving cell measurements are available according to the measurement configuration associated with the SCG:

6> set the *measResultServingCell* within *measResultServFreqListNR-SCG* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on SSB;

5> else if CSI-RS based serving cell measurements are available according to the measurement configuration associated with the SCG:

6> set the *measResultServingCell* within *measResultServFreqListNR-SCG* to include RSRP, RSRQ and the available SINR of the serving cell, derived based on CSI-RS;

4> if results for the serving cell derived based on SSB are included:

5> include the *ssbFrequency* to the value indicated by ssbFrequency as included in the *MeasObjectNR* of the serving cell;

4> if results for the serving cell derived based on CSI-RS are included:

5> include the *refFreqCSI-RS* to the value indicated by *refFreqCSI-RS* as included in the *MeasObjectNR* of the serving cell;

4> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport*:

5> for each serving cell configured with *servingCellMO*, include beam measurement information according to the associated *reportConfig* as described in 5.5.5.2, where availability is considered according to the measurement configuration associated with the SCG;

4> if *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:

5> if the *measObjectNR* indicated by the *servingCellMO* includes the RS resource configuration corresponding to the *rsType* indicated in the *reportConfig*:

6> set the *measResultBestNeighCellListNR* within *measResultServFreqListNR-SCG* to include one entry with the *physCellId* and the available measurement quantities based on the *reportQuantityCell* and *rsType* indicated in *reportConfig* of the non-serving cell corresponding to the concerned *measObjectNR* with the highest measured RSRP if RSRP measurement results are available for cells corresponding to this *measObjectNR*, otherwise with the highest measured RSRQ if RSRQ measurement results are available for cells corresponding to this *measObjectNR*, otherwise with the highest measured SINR, where availability is considered according to the measurement configuration associated with the SCG;

7> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport:*

8> for each best non-serving cell included in the measurement report:

9> include beam measurement information according to the associated *reportConfig* as described in 5.5.5.2, where availability is considered according to the measurement configuration associated with the SCG;

1> if the *measRSSI-ReportConfig* is configured within the corresponding *reportConfig* for this *measId*:

2> set the *rssi-Result* to the average of sample value(s) provided by lower layers in the *reportInterval;*

2> set the *channelOccupancy* to the rounded percentage of sample values which are beyond the *channelOccupancyThreshold* within all the sample values in the *reportInterval;*

1> if there is at least one applicable neighbouring cell to report:

2> if the *reportType* is set to *eventTriggered* or *periodical*:

3> set the *measResultNeighCells* to include the best neighbouring cells up to *maxReportCells* in accordance with the following:

4> if the *reportType* is set to *eventTriggered*:

5> include the cells included in the *cellsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;

4> else:

5> include the applicable cells for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

4> for each cell that is included in the *measResultNeighCells*, include the *physCellId*;

4> if the *reportType* is set to *eventTriggered* or *periodical*:

5> for each included cell, include the layer 3 filtered measured results in accordance with the *reportConfig* for this *measId*, ordered as follows:

6> if the *measObject* associated with this *measId* concerns NR:

7> if *rsType* in the associated *reportConfig* is set to *ssb*:

8> set *resultsSSB-Cell* within the *measResult* to include the SS/PBCH block based quantity(ies) indicated in the *reportQuantityCell* within the concerned *reportConfig*, in decreasing order of the sorting quantity, determined as specified in 5.5.5.3, i.e. the best cell is included first;

8> if *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport* are configured, include beam measurement information as described in 5.5.5.2;

7> else if *rsType* in the associated *reportConfig* is set to *csi-rs*:

8> set *resultsCSI-RS-Cell* within the *measResult* to include the CSI-RS based quantity(ies) indicated in the *reportQuantityCell* within the concerned *reportConfig*, in decreasing order of the sorting quantity, determined as specified in 5.5.5.3, i.e. the best cell is included first;

8> if *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport* are configured, include beam measurement information as described in 5.5.5.2;

6> if the *measObject* associated with this *measId* concerns E-UTRA:

7> set the *measResult* to include the quantity(ies) indicated in the *reportQuantity* within the concerned *reportConfigInterRAT* in decreasing order of the sorting quantity, determined as specified in 5.5.5.3, i.e. the best cell is included first;

6> if the *measObject* associated with this *measId* concerns UTRA-FDD and if *ReportConfigInterRAT* includes the *reportQuantityUTRA-FDD*:

7> set the *measResult* to include the quantity(ies) indicated in the *reportQuantityUTRA-FDD* within the concerned *reportConfigInterRAT* in decreasing order of the sorting quantity, determined as specified in 5.5.5.3, i.e. the best cell is included first;

2> else:

3> if the cell indicated by *cellForWhichToReportCGI* is an NR cell:

4> if *plmn-IdentityInfoList* of the *cgi-Info* for the concerned cell has been obtained:

5> include the *plmn-IdentityInfoList* including *plmn-IdentityList*, *trackingAreaCode* (if available), *ranac* (if available), *cellIdentity* and *cellReservedForOperatorUse* for each entry of the *plmn-IdentityInfoList*;

5> include *frequencyBandList* if available;

4> if *nr-CGI-Reporting-NPN* is supported by the UE and *npn-IdentityInfoList* of the *cgi-Info* for the concerned cell has been obtained:

5> include the *npn-IdentityInfoList* including *npn-IdentityList*, *trackingAreaCode*, *ranac* (if available), *cellIdentity* and *cellReservedForOperatorUse* for each entry of the *npn-IdentityInfoList*;

4> else if *MIB* indicates the *SIB1* is not broadcast:

5> include the *noSIB1* including the *ssb-SubcarrierOffset* and *pdcch-ConfigSIB1* obtained from *MIB* of the concerned cell;

3> if the cell indicated by *cellForWhichToReportCGI* is an E-UTRA cell:

4> if all mandatory fields of the *cgi-Info-EPC* for the concerned cell have been obtained:

5> include in the *cgi-Info-EPC* the fields broadcasted in E-UTRA *SystemInformationBlockType1* associated to EPC;

4> if the UE is E-UTRA/5GC capable and all mandatory fields of the *cgi-Info-5GC* for the concerned cell have been obtained:

5> include in the *cgi-Info-5GC* the fields broadcasted in E-UTRA *SystemInformationBlockType1* associated to 5GC;

4> if the mandatory present fields of the *cgi-Info* for the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* have been obtained:

5> include the *freqBandIndicator*;

5> if the cell broadcasts the *multiBandInfoList*, include the *multiBandInfoList*;

5> if the cell broadcasts the *freqBandIndicatorPriority*, include the *freqBandIndicatorPriority*;

1> if the corresponding *measObject* concerns NR:

2> if the *reportSFTD-Meas* is set to *true* within the corresponding *reportConfigNR* for this *measId*:

3> set the *measResultSFTD-NR* in accordance with the following:

4> set *sfn-OffsetResult* and *frameBoundaryOffsetResult* to the measurement results provided by lower layers;

4> if the *reportRSRP* is set to *true*;

5> set *rsrp-Result* to the RSRP of the NR PSCell derived based on SSB;

2> else if the *reportSFTD-NeighMeas* is included within the corresponding *reportConfigNR* for this *measId*:

3> for each applicable cell which measurement results are available, include an entry in the *measResultCellListSFTD-NR* and set the contents as follows:

4> set *physCellId* to the physical cell identity of the concered NR neighbour cell.

4> set *sfn-OffsetResult* and *frameBoundaryOffsetResult* to the measurement results provided by lower layers;

4> if the *reportRSRP* is set to *true*:

5> set *rsrp-Result* to the RSRP of the concerned cell derived based on SSB;

1> else if the corresponding *measObject* concerns E-UTRA:

2> if the *reportSFTD-Meas* is set to *true* within the corresponding *reportConfigInterRAT* for this *measId*:

3> set the *measResultSFTD-EUTRA* in accordance with the following:

4> set *sfn-OffsetResult* and *frameBoundaryOffsetResult* to the measurement results provided by lower layers;

4> if the *reportRSRP* is set to *true*;

5> set *rsrpResult-EUTRA* to the RSRP of the EUTRA PSCell;

1> if avareage uplink PDCP delay values are available:

2> set the *ul-PDCP-DelayValueResultList* to include the corresponding average uplink PDCP delay values;

1> if the *includeCommonLocationInfo* is configured in the corresponding *reportConfig* for this *measId* and detailed location information that has not been reported is available, set the content of *commonLocationInfo* of the *locationInfo* as follows:

2> include the locationTimestamp;

2> include the *locationCoordinate*, if available;

2> include the *velocityEstimate*, if available;

2> include the *locationError*, if available;

2> include the *locationSource*, if available;

2> if available, include the *gnss-TOD-msec*,

1> if the *includeWLAN-Meas* is configured in the corresponding *reportConfig* for this *measId*, set the *wlan-LocationInfo* of the *locationInfo* in the *measResults* as follows:

2> if available, include the *LogMeasResultWLAN*, in order of decreasing RSSI for WLAN APs;

1> if the *includeBT-Meas* is configured in the corresponding *reportConfig* for this *measId*, set the *BT-LocationInfo* of the *locationInfo* in the *measResults* as follows:

2> if available, include the *LogMeasResultBT*, in order of decreasing RSSI for Bluetooth beacons;

1> if the *includeSensor-Meas* is configured in the corresponding reportConfig for this *measId*, set the *sensor-LocationInfo* of the *locationInfo* in the *measResults* as follows:

2> if available, include the sensor-MeasurementInformation;

2> if available, include the *sensor-MotionInformation*;

1> if there is at least one applicable transmission resource pool for NR sidelink communication or V2X sidelink communication to report (for *measResultSL*):

2> set the *measResultsListSL* to include the CBR measurement results in accordance with the following:

3> if the reportType is set to eventTriggered:

4> include the transmission resource pools included in the *poolsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;

3> else:

4> include the applicable transmission resource pools for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

3> if the corresponding *measObject* concerns NR sidelink communication, then for each transmission resource pool to be reported:

4> set the *sl-poolReportIdentity* to the identity of this transmission resource pool;

4> set the *sl-CBR-ResultsNR* to the CBR measurement results on PSSCH and PSCCH of this transmission resource pool provided by lower layers, if available;

3> if the corresponding *measObject* concerns V2X sidelink communication, then for each transmission resource pool to be reported:

4> set the *sl-poolReportIdentity* to the *SL-ResourcePoolID-EUTRA* of this transmission resource pool (as identified in the corresponding *measObject*);

4> set *cbr-PSSCH-ResultsEUTRA* and *cbr-PSCCH-ResultsEUTRA* (when applicable)to the CBR measurement results on PSSCH and PSCCH of this transmission resource pool provided by lower layers, as specified in subclause 5.5.5 of TS 36.331 [10];

NOTE 1: The *cbr-PSSCH-ResultsEUTRA* and *cbr-PSCCH-ResultsEUTRA* are set in the same way as *cbr-PSSCH* and *cbr-PSCCH* insubclause 5.5.5 of TS 36.331 [10], respectively.

1> if there is at least one applicable CLI measurement resource to report:

2> if the *reportType* is set to *cli-EventTriggered* or *cli-Periodical*:

3> set the *measResultCLI* to include the most interfering SRS resources or most interfering CLI-RSSI resources up to *maxReportCLI* in accordance with the following:

4> if the *reportType* is set to *cli-EventTriggered*:

5> if trigger quantity is set to *srs-RSRP* i.e. *i1-Threshold* is set to *srs-RSRP*:

6> include the SRS resource included in the *cli-TriggeredList* as defined within the *VarMeasReportList* for this *measId*;

5> if trigger quantity is set to *cli-RSSI* i.e. *i1-Threshold* is set to *cli-RSSI*:

6> include the CLI-RSSI resource included in the *cli-TriggeredList* as defined within the *VarMeasReportList* for this *measId*;

4> else:

5> if *reportQuantityCLI* is set to *srs-rsrp*:

6> include the applicable SRS resources for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

5> else:

6> include the applicable CLI-RSSI resources for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

4> for each SRS resource that is included in the *measResultCLI*:

5> include the *srs-ResourceId*;

5> set *srs-RSRP-Result* to include the layer 3 filtered measured results in decreasing order, i.e. the most interfering SRS resource is included first;

4> for each CLI-RSSI resource that is included in the *measResultCLI*:

5> include the *rssi-ResourceId*;

5> set *cli-RSSI-Result* to include the layer 3 filtered measured results in decreasing order, i.e. the most interfering CLI-RSSI resource is included first;

1> increment the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* by 1;

1> stop the periodical reporting timer, if running;

1> if the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* is less than the *reportAmount* as defined within the corresponding *reportConfig* for this *measId*:

2> start the periodical reporting timer with the value of *reportInterval* as defined within the corresponding *reportConfig* for this *measId*;

1> else:

2> if the *reportType* is set to *periodical* or *cli-Periodical*:

3> remove the entry within the *VarMeasReportList* for this *measId*;

3> remove this *measId* from the *measIdList* within *VarMeasConfig*;

1> if the UE is in (NG)EN-DC:

2> if SRB3 is configured:

3> submit the *MeasurementReport* message via SRB3 to lower layers for transmission, upon which the procedure ends;

2> else:

3> submit the *MeasurementReport* message via E-UTRA embedded in E-UTRA RRC message *ULInformationTransferMRDC* as specified in TS 36.331 [10].

1> else if the UE is in NR-DC:

2> if the measurement configuration that triggered this measurement report is associated with the SCG:

3> if SRB3 is configured:

4> submit the *MeasurementReport* message via SRB3 to lower layers for transmission, upon which the procedure ends;

3> else:

4> submit the *MeasurementReport* message via SRB1 embedded in NR RRC message *ULInformationTransferMRDC* as specified in5.7.2a.3;

2> else:

3> submit the *MeasurementReport* message via SRB1 to lower layers for transmission, upon which the procedure ends;

1> else:

2> submit the *MeasurementReport* message to lower layers for transmission, upon which the procedure ends.

*Next Modified Subclause*

### 6.2.2 Message definitions

<Unchangeed text omitted>

– *RRCResumeComplete*

The *RRCResumeComplete* message is used to confirm the successful completion of an RRC connection resumption.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

***RRCResumeComplete* message**

-- ASN1START

-- TAG-RRCRESUMECOMPLETE-START

RRCResumeComplete ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcResumeComplete RRCResumeComplete-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCResumeComplete-IEs ::= SEQUENCE {

 dedicatedNAS-Message DedicatedNAS-Message OPTIONAL,

 selectedPLMN-Identity INTEGER (1..maxPLMN) OPTIONAL,

 uplinkTxDirectCurrentList UplinkTxDirectCurrentList OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCResumeComplete-v16xy-IEs OPTIONAL

}

RRCResumeComplete-v16xy-IEs ::= SEQUENCE {

 idleMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

 measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

 scg-Response CHOICE {

 nr-SCG-Response OCTET STRING (CONTAINING RRCReconfigurationComplete),

 eutra-SCG-Response OCTET STRING

 } OPTIONAL,

 logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

 connEstFailInfoAvailable-r16 ENUMERATED {true} OPTIONAL,

 rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

 mobilityHistoryAvail-r16 ENUMERATED {true} OPTIONAL,

 mobilityState-r16 ENUMERATED {normal, medium, high, spare} OPTIONAL,

 nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-RRCRESUMECOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCResumeComplete-IEs* field descriptions** |
| ***idleMeasAvailable***Indication that the UE has idle/inactive measurement report available. |
| ***measResultIdleEUTRA***EUTRA measurement results performed during RRC\_INACTIVE. |
| ***measResultIdleNR***NR measurement results performed during RRC\_INACTIVE. |
| ***selectedPLMN-Identity***Index of the PLMN selected by the UE from the *plmn-IdentityList* or *npn-IdentityInfoList* fields included in *SIB1*. |
| ***uplinkTxDirectCurrentList***The Tx Direct Current locations for the configured serving cells and BWPs if requested by the NW (see *reportUplinkTxDirectCurrent* in *CellGroupConfig*). |

<Unchangeed text omitted>

– *RRCSetupComplete*

The *RRCSetupComplete* message is used to confirm the successful completion of an RRC connection establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

***RRCSetupComplete* message**

-- ASN1START

-- TAG-RRCSETUPCOMPLETE-START

RRCSetupComplete ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcSetupComplete RRCSetupComplete-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCSetupComplete-IEs ::= SEQUENCE {

 selectedPLMN-Identity INTEGER (1..maxPLMN),

 registeredAMF RegisteredAMF OPTIONAL,

 guami-Type ENUMERATED {native, mapped} OPTIONAL,

 s-NSSAI-List SEQUENCE (SIZE (1..maxNrofS-NSSAI)) OF S-NSSAI OPTIONAL,

 dedicatedNAS-Message DedicatedNAS-Message,

 ng-5G-S-TMSI-Value CHOICE {

 ng-5G-S-TMSI NG-5G-S-TMSI,

 ng-5G-S-TMSI-Part2 BIT STRING (SIZE (9))

 } OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCSetupComplete-v16xy-IEs OPTIONAL

}

RRCSetupComplete-v16xy-IEs ::= SEQUENCE {

 iab-NodeIndication-r16 ENUMERATED {true} OPTIONAL,

 idleMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

 connEstFailInfoAvailable-r16 ENUMERATED {true} OPTIONAL,

 rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

 mobilityHistoryAvail-r16 ENUMERATED {true} OPTIONAL,

 mobilityState-r16 ENUMERATED {normal, medium, high, spare} OPTIONAL,

 nonCriticalExtension SEQUENCE{} OPTIONAL

}

RegisteredAMF ::= SEQUENCE {

 plmn-Identity PLMN-Identity OPTIONAL,

 amf-Identifier AMF-Identifier

}

-- TAG-RRCSETUPCOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCSetupComplete-IEs* field descriptions** |
| ***guami-Type***This field is used to indicate whether the GUAMI included is native (derived from native 5G-GUTI) or mapped (from EPS, derived from EPS GUTI) as specified in TS 24.501 [23]. |
| ***iab-NodeIndication-r16***This field is used to indicate that the connection is being established by an IAB-node [2]. |
| ***idleMeasAvailable***Indication that the UE has idle/inactive measurement report available. |
| ***mobilityState***This field indicates the UE mobility state (as defined in TS 38.304 [20], clause 5.2.4.3) just prior to UE going into RRC\_CONNECTED state. The UE indicates the value of *medium* and *high* when being in Medium-mobility and High-mobility states respectively. Otherwise the UE indicates the value *normal*. |
| ***ng-5G-S-TMSI-Part2***The leftmost 9 bits of 5G-S-TMSI. |
| ***registeredAMF***This field is used to transfer the GUAMI of the AMF where the UE is registered, as provided by upper layers, see TS 23.003 [21]. |
| ***selectedPLMN-Identity***Index of the PLMN or SNPN selected by the UE from the *plmn-IdentityList* or *npn-IdentityInfoList* fields included in SIB1. |

<Unchangeed text omitted>

<Unchangeed text omitted>

*Next Modified Subclause*

6.3.1 System information blocks

<Unchangeed text omitted>

– *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,

 ...,

 [[

 intraFreqWhiteCellList-r16 IntraFreqWhiteCellList-r16 OPTIONAL, -- Need R

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

]]

}

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

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

 ...,

 [[

 ssb-PositionQCL-r16 SSB-PositionQCL-Relationship-r16 OPTIONAL -- Need R

 ]]

}

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

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

IntraFreqCAG-CellList-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. |
| ***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. |

– *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 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo

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

 ...,

 [[

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

 interFreqWhiteCellList-r16 InterFreqWhiteCellList-r16 OPTIONAL, -- Need R

 ssb-PositionQCL-Common-r16 SSB-PositionQCL-Relationship-r16 OPTIONAL, -- Need R

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

 ]]

}

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

InterFreqNeighCellInfo ::= 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

 ...,

 [[

 ssb-PositionQCL-r16 SSB-PositionQCL-Relationship-r16 OPTIONAL -- Need R

 ]]

}

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

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

InterFreqCAG-CellList-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.  |
| ***interFreqNeighCellList***List of inter-frequency neighbouring cells with specific cell re-selection parameters. |
| ***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. |

<Unchangeed text omitted>

– *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. |

*Next Modified Subclause*

6.3.2 Radio resource control information elements

<Unchangeed text omitted>

– *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. |
| ***cellReservedForOtherUse***Indicates whether the cell is reserved, as defined in 38.304 [20]. The field is applicable to all PLMNs. |
| ***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. |

<Unchangeed text omitted>

– *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-Identity*. 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*. |

– *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},

 ...

}

-- TAG-NPN-IDENTITYINFOLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***NPN-IdentityInfoList* field descriptions** |
| ***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. |
| ***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-IdentyList*) as defined in TS 38.304 [20]. |

<Unchangeed text omitted>

– *SI-SchedulingInfo*

The IE *SI-SchedulingInfo* contains information needed for acquisition of SI messages.

***SI-SchedulingInfo* information element**

-- ASN1START

-- TAG–SI-SCHEDULINGINFO-START

SI-SchedulingInfo ::= SEQUENCE {

 schedulingInfoList SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo,

 si-WindowLength ENUMERATED {s5, s10, s20, s40, s80, s160, s320, s640, s1280},

 si-RequestConfig SI-RequestConfig OPTIONAL, -- Cond MSG-1

 si-RequestConfigSUL SI-RequestConfig OPTIONAL, -- Cond SUL-MSG-1

 systemInformationAreaID BIT STRING (SIZE (24)) OPTIONAL, -- Need R

 ...

}

SchedulingInfo ::= SEQUENCE {

 si-BroadcastStatus ENUMERATED {broadcasting, notBroadcasting},

 si-Periodicity ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

 sib-MappingInfo SIB-Mapping

}

SIB-Mapping ::= SEQUENCE (SIZE (1..maxSIB)) OF SIB-TypeInfo

SIB-TypeInfo ::= SEQUENCE {

 type ENUMERATED {sibType2, sibType3, sibType4, sibType5, sibType6, sibType7, sibType8, sibType9,

 sibType10-r16, spare7, spare6, spare5, spare4, spare3, spare2, spare1,... },

 valueTag INTEGER (0..31) OPTIONAL, -- Cond SIB-TYPE

 areaScope ENUMERATED {true} OPTIONAL -- Need S

}

-- Configuration for Msg1 based SI Request

SI-RequestConfig::= SEQUENCE {

 rach-OccasionsSI SEQUENCE {

 rach-ConfigSI RACH-ConfigGeneric,

 ssb-perRACH-Occasion ENUMERATED {oneEighth, oneFourth, oneHalf, one, two, four, eight, sixteen}

 } OPTIONAL, -- Need R

 si-RequestPeriod ENUMERATED {one, two, four, six, eight, ten, twelve, sixteen} OPTIONAL, -- Need R

 si-RequestResources SEQUENCE (SIZE (1..maxSI-Message)) OF SI-RequestResources

}

SI-RequestResources ::= SEQUENCE {

 ra-PreambleStartIndex INTEGER (0..63),

 ra-AssociationPeriodIndex INTEGER (0..15) OPTIONAL, -- Need R

 ra-ssb-OccasionMaskIndex INTEGER (0..15) OPTIONAL -- Need R

}

-- TAG-SI-SCHEDULINGINFO-STOP

-- ASN1STOP

|  |
| --- |
| ***SchedulingInfo* field descriptions** |
| ***areaScope***Indicates that a SIB is area specific. If the field is absent, the SIB is cell specific. |
| ***si-BroadcastStatus***Indicates if the SI message is being broadcasted or not. Change of *si-BroadcastStat*us should not result in system information change notifications in Short Message transmitted with P-RNTI over DCI (see clause 6.5). The value of the indication is valid until the end of the BCCH modification period when set to *broadcasting*. |
| ***si-Periodicity***Periodicity of the SI-message in radio frames. Value *rf8* corresponds to 8 radio frames, value *rf16* corresponds to 16 radio frames, and so on. |

|  |
| --- |
| ***SI-RequestConfig* field descriptions** |
| ***rach-OccasionsSI***Configuration of dedicated RACH Occassions for SI. If the field is absent, the UE uses the corresponding parameters configured in *rach-ConfigCommon* of the initial uplink BWP. |
| ***si-RequestPeriod***Periodicity of the *SI-Request* configuration in number of association periods. |
| ***si-RequestResources***If there is only one entry in the list, the configuration is used for all SI messages for which *si-BroadcastStatus* is set to *notBroadcasting*. Otherwise the 1st entry in the list corresponds to the first SI message in *schedulingInfoList* for which *si-BroadcastStatus* is set to *notBroadcasting*, 2nd entry in the list corresponds to the second SI message in *schedulingInfoList* for which *si-BroadcastStatus* is set to *notBroadcasting* and so on. Change of *si-RequestResources* should not result in system information change notification. |

|  |
| --- |
| ***SI-RequestResources* field descriptions** |
| ***ra-AssociationPeriodIndex***Index of the association period in the si-RequestPeriod in which the UE can send the SI request for SI message(s) corresponding to this *SI-RequestResources*, using the preambles indicated by *ra-PreambleStartIndex* and rach occasions indicated by *ra-ssb-OccasionMaskIndex*. |
| ***ra-PreambleStartIndex***If N SSBs are associated with a RACH occasion, where N > = 1, for the i-th SSB (i=0, …, N-1) the preamble with preamble index = *ra-PreambleStartIndex* + i is used for SI request; For N < 1, the preamble with preamble index = *ra-PreambleStartIndex* is used for SI request. |

|  |
| --- |
| ***SI-SchedulingInfo* field descriptions** |
| ***si-RequestConfig***Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *si-BroadcastStatus* is set to notBroadcasting. |
| ***si-RequestConfigSUL***Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *si-BroadcastStatus* is set to notBroadcasting. |
| ***si-WindowLength***The length of the SI scheduling window. Value *s5* corresponds to 5 slots, value *s10* corresponds to 10 slots and so on. The network always configures *si-WindowLength* to be shorter than or equal to the *si-Periodicity*. |
| ***systemInformationAreaID***Indicates the system information area that the cell belongs to, if any. Any SIB with *areaScope* within the SI is considered to belong to this *systemInformationAreaID*. The systemInformationAreaID is unique within a PLMN. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *MSG-1* | The field is optionally present, Need R, if *si-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *SchedulingInfo*. It is absent otherwise. |
| *SIB-TYPE* | The field is mandatory present if the SIB type is different from *SIB6*, *SIB7* or *SIB8*. For *SIB6*, *SIB7* and *SIB8* it is absent. |
| *SUL-MSG-1* | The field is optionally present, Need R, if this serving cell is configured with a supplementary uplink and if *si-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *SchedulingInfo*. It is absent otherwise. |

<Unchangeed text omitted>

*– UAC-BarringPerPLMN-List*

The IE *UAC-BarringPerPLMN-List* provides access category specific access control parameters, which are configured per PLMN.

***UAC-BarringPerPLMN-List* information element**

-- ASN1START

-- TAG-UAC-BARRINGPERPLMN-LIST-START

UAC-BarringPerPLMN-List ::= SEQUENCE (SIZE (1.. maxPLMN)) OF UAC-BarringPerPLMN

UAC-BarringPerPLMN ::= SEQUENCE {

 plmn-IdentityIndex INTEGER (1..maxPLMN),

 uac-ACBarringListType CHOICE{

 uac-ImplicitACBarringList SEQUENCE (SIZE(maxAccessCat-1)) OF UAC-BarringInfoSetIndex,

 uac-ExplicitACBarringList UAC-BarringPerCatList

 } OPTIONAL -- Need S

}

-- TAG-UAC-BARRINGPERPLMN-LIST-STOP

-- ASN1STOP

|  |
| --- |
| ***UAC-BarringPerPLMN-List* field descriptions** |
| ***uac-ACBarringListType***Access control parameters for each access category valid only for a specific PLMN or SNPN. UE behaviour upon absence of this field is specified in clause 5.3.14.2. |
| ***plmn-IdentityIndex***Index of the PLMN or SNPN across the *plmn-IdentityList* and *npn-IdentityInfoList* fields included in SIB1. |

<Unchangeed text omitted>

*Next Modified Subclause*

6.4 RRC multiplicity and type constraint values

– Multiplicity and type constraint definitions

-- ASN1START

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-START

<Unchanged text omitted>

maxCAG-Cell-r16 INTEGER ::= 16 -- Maximum number of NR CAG cell ranges in SIB3, SIB4

<Unchanged text omitted>

maxInterRAT-RSTD-Freq INTEGER ::= 3

maxHRNN-Len-r16 INTEGER ::= 48 -- Maximum length of HRNNs

maxNPN-r16 INTEGER ::= 12 -- Maximum number of NPNs broadcast and reported by UE at establishment

<Unchanged text omitted>

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-STOP

-- ASN1STOP